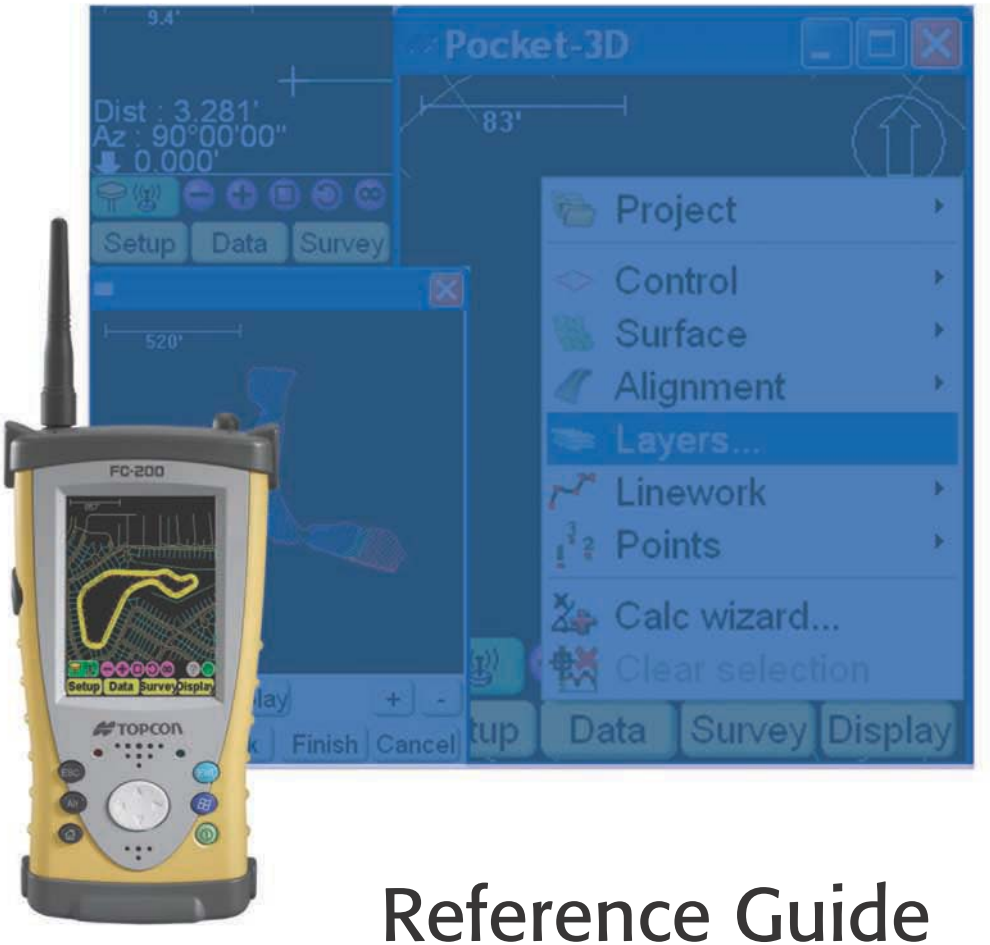
TOPCON

Pocket-3D



Reference Guide

TOPCON
POSITIONING SYSTEMS

Pocket-3D Reference Guide

Part Number 7010-0628
Rev J

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February 2012

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Preface

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Manual Conventions

This manual uses the following conventions:

Example	Explanation
File ▸ Exit	Tap/press the **File** menu and tap/press **Exit**.
Enter	Tap or press the button or key labeled **Enter**.
Topo	Indicates the name of a dialog box or screen.
Notes	Indicates a field on a dialog box or screen, or a tab within a dialog box or screen.

Supplementary information that can help you configure, maintain, or set up a system.

Supplementary information that can have an affect on system operation, system performance, measurements, or personal safety.

Notification that an action has the potential to adversely affect system operation, system performance, data integrity, or personal health.

Notification that an action ***will*** result in system damage, loss of data, loss of warranty, or personal injury.

Under no circumstances should this action be performed.

Notes:

What's New with Pocket-3D

The following list briefly describes new features and functions for the latest version (v.10.0) of Pocket-3D.

- ⇨ Stake-out Options
  - You can now display customized information for the following, including content and size and color of text.
    - – surface check
    - – point staking
    - – road staking
- ⇨ Internal GPS – on the FC-25 and FC-236 hand-helds (controllers) you can use the device's internal GPS for rough GPS guidance and measurement (low accuracy less than 5m).
- ⇨ DGPS Support features
  - There is now a DGPS (low accuracy <1m) option receiver type for dozers and compactors. (Designed to be used in conjunction with DGPS network corrections).
- ⇨ MAC/VRS option for Network RTK – you can now choose between VRS and (Leica) MAC network types.
- ⇨ The password protection mechanism has been changed to allow a larger number of options and to provide a better security. Because the new codes are much longer, you now have the ability to import them directly from an option file on a USB dongle, etc. Existing installs of Pocket-3D will automatically be upgraded to the new protection mechanism
  See "Starting Pocket-3D" on page 1-5 for more information

- Base station manufacturer – On the Advanced tab of the "GPS info" screen, you can now select which GPS reference station manufacturer to use. This helps with correct RTK operation where GLONASS is used at the Base and Rover when the base is not a Topcon base. See "Apply GPS Receiver Settings" on page 1-20 for more information.
- NTRIP virtual ports – It is no longer necessary to manually specify a "virtual port" for NTRIP corrections because it is handled automatically handled by the software.

The following list briefly describes the features and functions for version 9.2 of Pocket-3D, which was an incremental release version of the Pocket-3D 9.x series for Windows Mobile, Windows CE, and Windows XP/Vista/7 platforms.

- Platforms – In addition to the FC-120, FC-200, and the GRS-1 controller platforms and Windows platforms, Pocket-3D now runs on the FC-25 and FC-2500 controllers.
- Site-Link 3D – Pocket-3D now supports Site-Link connectivity, allowing users to transfer files, project data, and messages to other 3DMC, 3D-Office, and Pocket-3D users on the jobsite.
  - NOTE: This is an **Optional** feature controlled by OAF. You must be connected to a Site-Link service (provided directly by Topcon or by a Site-Link server hosted on the job).
- DGPS – You can now select a "GPS (Augmented)" sensor type for the equipment configuration, which allows you to run without RTK corrections (or without RTK options in the receiver). See "Sample Configuration 4: Prism and Total Station" on page 2-32 for details.
- RC-4 – Pocket-3D 9.2 supports the new RC-4 modem for communicating with robotic total stations. See "Sample Configuration 4: Prism and Total Station" on page 2-32 for details.

⇨ Other – Pocket-3D 9.2 now handles significantly larger project files (up to 10 times larger than before). Also, on-screen panning/zooming selection with large data files is greatly improved.

The following list briefly describes the features and functions for version 9.1 of Pocket-3D:

⇨ TP3 Project Files:

- All project/design data is now contained within a single Topcon TP3 file, via 3D-Office, which is the standard project configuration for all 9.1 series releases.
- Existing TIN/Road/Linework/Point/Control files can be imported/exported for TP3 files.
- A brief summary of the TP3 project file contents can be viewed from the Project file(s) listing ("Info").

⇨ MX3 Machine Files – all machine configurations are now stored with MX3 file extensions and are in human-readable XML format. Older (*.MB3) machine configurations are not supported.

⇨ Authorization Codes – the password protection mechanism has been changed to allow a larger number of options and to provide a better security. Because the new codes are much longer, you now have the ability to import them directly from an option file on a USB dongle, etc. Existing installs of Pocket-3D will automatically be upgraded to the new protection mechanism See "Starting Pocket-3D" on page 1-5 for more information.

Grade Indicator – A grade-indicator bar, similar to 3DMC, can be displayed when doing a surface check. In Surface Check mode the user can now select to see a tri-color grade-indicator similar to the one seen in the 3DMC software that gives real-time cut/fill updates to the design surface. The grade-indicator option is located in the display menu and only shows up when there is an active surface or alignment. To adjust the grade indicator settings, press and hold on the grade-indicator strip to access a sub-menu containing options for tolerances and range.

See “Cut/Fill “Real-Time” Updates” on page 4-24 for more information on how to access and use the grade indicator.

⇨ Cosmetic Changes:

- Buttons now have 3D edges.
- Menu items, surface, and equipment lists now have descriptive bitmaps.

⇨ Miscellaneous Changes:

- File and point lists are now sorted alphabetically. Point lists can also be sorted by clicking the column header.
- Point description fields are now drop-down lists where previously set descriptions can be retrieved.
- Multiple selections have been added for Points, Lines, Layers, and Surfaces.
- New layers can now be created inside the layer selection drop-down list.
- Updated projections list, now also includes support for table projection and multiple datums.
- Polyline segments can be viewed and edited within a list.
- The direction of a polyline can now be reversed by using the pop-up menu. Click **Linework>Reverse** from the context pop-up menu, which is activated by holding the stylus down for one second or alternatively pressing the **ALT** button.
  See “Main Screen” on page 1-6 for more information.
- Also, in the context menu, the length of the selected polyline and single or multiple polyline segments can be shown. Click **Calcs ><Station>**.
- Polylines can now be joined together.
- Added support for NAD83_NO_Trans. This is an added datum option to support the use of a non-Topcon base station. There is a difference between NAD83 and WGS84 parameters. When using a non-Topcon base station, a shift would appear. A third-party base receiver use to be the only option.
  See “Support for non-Topcon Base Station” on page 3-22 for

more information.

NOTE: When using an RS1 radio on the FC_250, you must select COM3 for the radio port in the configuration. The port is not labeled 'radio' but it is the only port available for RS1 communication.

NOTE: Due to an increase in program size, we recommend users do NOT use any data files over 2MB in Pocket-3D. This DOES NOT mean that you cannot use data files over 2MB, but you should be aware that issues could arise if you go over this limit.

The following list briefly describes the features and functions for version 9.0 of Pocket-3D.

- ⇨ Auto-topo improvements – Improvements have been made to the management of very large topo survey data sets and to auto-topo logging at high speed (up to 5 points per second).
- ⇨ User Interface – Screen colors and fonts have been enhanced to improve visibility in sunlight and to achieve a more modern look and feel.
  - Buttons now have 3D edges.

Menu items, surface, and equipment lists now have descriptive bitmaps.

Notes:

Installing Pocket-3D

Welcome to Pocket-3D™, the software contractors use to build job files, check cuts and fills, layout points, and survey all or part of a jobsite. This software comes on a CD and is ready to install on a hand-held controller—such as, the Topcon FC-236™, GRS-1, or the FC-250—and is only available as part of the 3DMC Bundle from Topcon™ dealers.

Figure 1-1. Pocket-3D on Controller (Topcon's FC-236)

NOTE: Pocket-3D now runs on FC25 and FC2500 controllers.

Guide to Installing Pocket-3D

Pocket-3D installs on any hand-held controller that runs the Windows Pocket PC operating system, including Topcon's FC236. Pocket-3D initially loads onto your computer, then uses Microsoft® ActiveSync® to synchronize with the controller and install Pocket-3D onto the controller. ActiveSync is available for free from the Microsoft website (www.microsoft.com) and must be installed on the computer before installing Pocket-3D.

The Pocket-3D program for your hand-held controller is located on the 3DMC CD. It will first be loaded onto your computer, then ActiveSync will install it onto your controller.

1. Connect your computer and hand-held controller.
   Because ActiveSync will automatically install Pocket-3D once it has been loaded onto the computer, this step is can be performed at any time.
2. Insert the 3DMC software CD into the computer CD drive of the computer. Navigate to the CD's files using Explorer and open the Pocket-3D folder.
3. Click the Pocket-3D setup icon to run the install program and click **Next** on the ***Welcome*** screen (Figure 1-2).

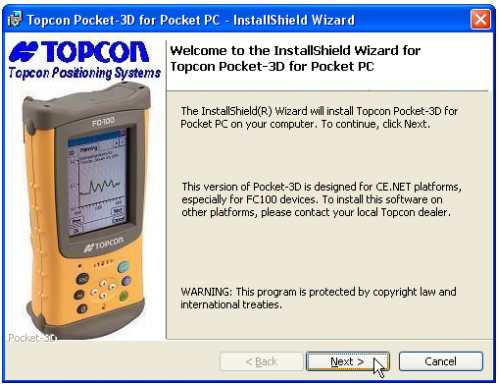

Topcon Pocket-3D for Pocket PC - InstallShield Wizard
TOPCON
Topcon Positioning Systems
Welcome to the InstallShield Wizard for Topcon Pocket-3D for Pocket PC
The InstallShield(R) Wizard will install Topcon Pocket-3D for Pocket PC on your computer. To continue, click Next.
This version of Pocket-3D is designed for CE.NET platforms, especially for FC100 devices. To install this software on other platforms, please contact your local Topcon dealer.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

Figure 1-2. Begin Pocket-3D Installation

4. Review the ***License Agreement***. If you accept the terms, click the "**I accept...**" radio button, then click **Next** (Figure 1-3). Click "I do not accept..." to terminate the installation.

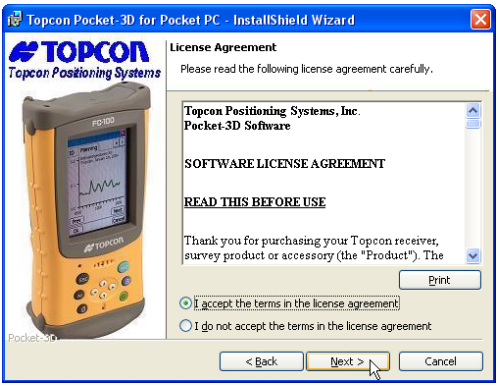

Topcon Pocket-3D for Pocket PC - InstallShield Wizard
TOPCON
Topcon Positioning Systems
License Agreement
Please read the following license agreement carefully.
Topcon Positioning Systems, Inc.
Pocket-3D Software
SOFTWARE LICENSE AGREEMENT
READ THIS BEFORE USE
Thank you for purchasing your Topcon receiver, survey product or accessory (the "Product"). The
Print
I accept the terms in the license agreement
I do not accept the terms in the license agreement
< Back
Next >
Cancel

Figure 1-3. Review and Accept License Agreement

5. Click **Install** to load Pocket-3D on the computer (Figure 1-4).

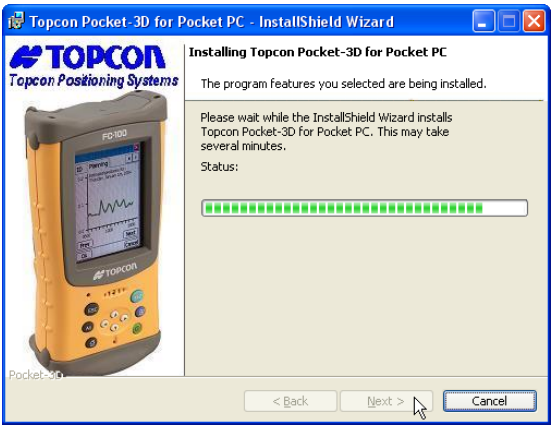

Topcon Pocket-3D for Pocket PC - InstallShield Wizard
TOPCON
Topcon Positioning Systems
Installing Topcon Pocket-3D for Pocket PC
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs Topcon Pocket-3D for Pocket PC. This may take several minutes.
Status:
< Back
Next >
Cancel

Figure 1-4. Install Pocket-3D on Computer

6. With the computer and controller connected, ActiveSync will start up and retrieve the controller's programs.

   If Pocket-3D is already installed, ActiveSync ask to uninstall it from the controller. When ActiveSync completes the uninstall process, double-click the Pocket-3D setup icon to have ActiveSync install the software on the controller.

7. ActiveSync will begin the Pocket-3D install process for the hand-held controller (Figure 1-5).

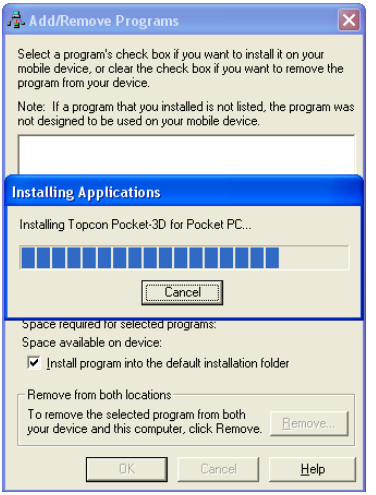

Add/Remove Programs
Select a program's check box if you want to install it on your mobile device, or clear the check box if you want to remove the program from your device.
Note: If a program that you installed is not listed, the program was not designed to be used on your mobile device.
Installing Applications
Installing Topcon Pocket-3D for Pocket PC...
Cancel
Space required for selected programs:
Space available on device:
Install program into the default installation folder
Remove from both locations
To remove the selected program from both your device and this computer, click Remove.
Remove...
OK
Cancel
Help

Figure 1-5. Install Pocket-3D on Controller

8. Click **Yes** to install Pocket-3D to the default directory on the controller (Figure 1-6).

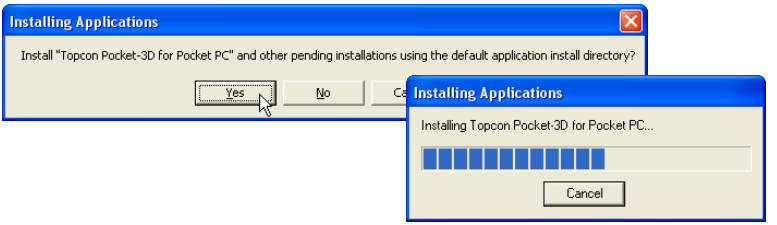

Installing Applications
Install "Topcon Pocket-3D for Pocket PC" and other pending installations using the default application install directory?
Yes
No
Installing Applications
Installing Topcon Pocket-3D for Pocket PC...
Cancel

Figure 1-6. Installing into Default Directory

When the controller install completes, ActiveSync displays a notice to check the controller for any further installation procedures. However, Pocket-3D has no further installation steps. Click **OK** to continue.

9. Click **Finish** to exit the install program (Figure 1-7 on page 1-5).

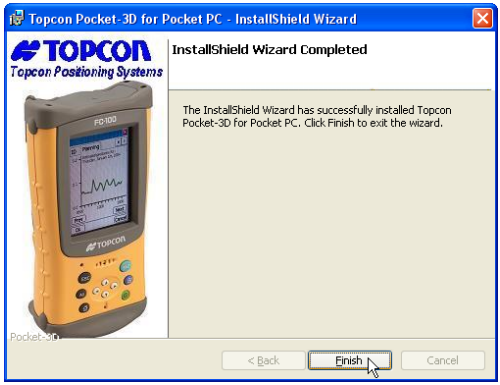

Topcon Pocket-3D for Pocket PC - InstallShield Wizard
TOPCON
Topcon Positioning Systems
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed Topcon Pocket-3D for Pocket PC. Click Finish to exit the wizard.
< Back
Finish
Cancel

Figure 1-7. Finish Install and Exit

Starting Pocket-3D

To start Pocket-3D, press the**Windows** icon and press **Pocket3D** in the program list.

Upon initial startup, Pocket-3D requires authorization codes to properly run (Figure 1-8 on page 1-6). The password protection mechanism has been changed to allow a larger number of options and to provide better security. Because the codes are much longer now, you can import directly from an option file on a USB dongle, etc. Existing installs of Pocket-3D will automatically be upgraded to the new protection mechanism. New users will require codes generated via the new “Keygen2” application.

- Device identification
- Company name
- Contact name
- Company address
- Contact phone number
- Contact email address
- Software Type (Pocket-3D)

When you receive the authorization codes, enter them into the appropriate fields on the ***Device Identification*** screen and press **Ok** (Figure 1-8 on page 1-6).

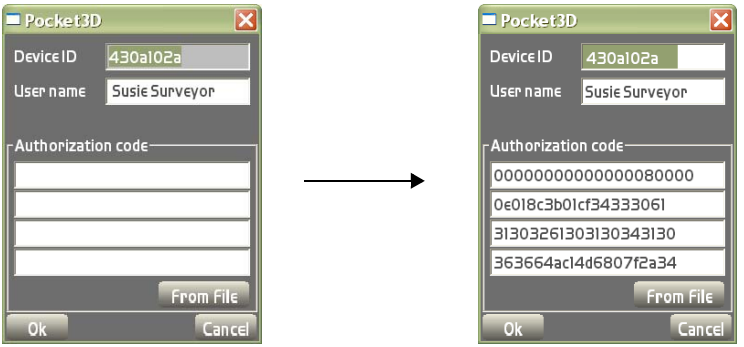


Figure 1-8. Enter Authorization Codes

Once entered, the authorization codes can then be located on the ***about Pocket-3D*** screen for easy access. In v10.0, the authorization codes no longer change due to new installations. To view updated installed options, see "Main Screen" below.

Authorization Codes: More options are now available to provide better security. Because new codes are much longer, you can now import them directly from an option file onto a USB dongle, etc.

Existing installs of Pocket-3D will automatically be upgraded to the new password protection mechanism.

Main Screen

The Pocket-3D main screen (Figure 1-9 on page 1-7) has the following components:

- Main Window – displays a graphical representation of the design surface and machine. The display varies according to the selected file and display options.
- Toolbar – provides icons for frequently used functions. See "Toolbar" on page 1-12 for more information.

- Menu bar – contains pop-up menus for the various functions available in Pocket-3D. The following chapters describe each menu in detail.

Figure 1-9. Pocket-3D Main Screen

The pop-up menus on the main screen (Figure 1-12 on page 1-9) contain frequently accessed functions, and information about selected data. To display the pop-up menu, rest the controller's stylus on the point, station, or polyline for at least one (1) second or alternatively press the ALT button.

The pop-up (context) menu options depend on the type of file open and the information selected.

- Clear selection – deselects the selected entities (functions the same as the **Data ▸ Clear selection** menu option).
- Hide layer(s) – hides selected layers on the main screen.
- Surface (Figure 1-12 on page 1-9) – sends a message, via Site-Link to the machine operator in the field.
- Alignment (Figure 1-13 on page 1-10):
  - Stakeout: stakes out the selected point
  - Use as reference line: uses the selected alignment as a reference line to create/measure new points at a specific station and offset – same for polyline.
  - Send Via Site-Link: sends a message to the operator in the field.

- Segment (Figure 1-15 on page 1-10) – Add, insert, edit, delete, create or select entire polyline(s).
- Linework (Figure 1-10):
  - Delete: deletes the selected linework/polyline or the last segment.
  - Join Selected Polyline(s): joins highlighted polylines on the main screen.
  - Merge Selected Polyline(s): merges highlighted polylines on the main screen.
  - Unclose polyline(s): opens previously closed polylines.
  - Send via Site-Link: sends a message to the operator in the field.
  - Length: total length of selected polyline

Figure 1-10. Lengths Context Menu Option

- Points – adds, edits, deletes, or stakes-out point(s) (Figure 1-16 on page 1-11)
  - Add a point: adds the selected point(s).
  - Delete a point: deletes the selected point(s).
  - Send via Site-Link: sends a message to the machine operator in the field.
  - Stake-out point: stakes out the selected point(s).
  - Use as reference line: uses the selected polyline as a reference line during a stake-out.
- Calcs – performs common polyline calculations (Figure 1-17 on page 1-11)
  - Create new polyline: creates a new polyline.

– Create closed polyline: creates a closed polyline.
– Create tin surface: creates a TIN surface.
– Move object(s): moves the current cursor position to where the stylus clicked on the main screen (only available in simulation mode).
– Copy object(s): copies the selected entity with the mouse.

Figure 1-11. Calcs Context Menu Option

Context (Pop-Up) Menu Options

Figure 1-13 through Figure 1-18 shows the context menu options for ***Surface***, ***Alignment***, ***Linework***, ***Segment***, ***Point***, ***Calcs***, and ***GoTo*** parameters.

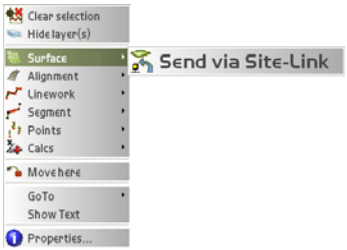


Figure 1-12. Context Menu – Surface Options

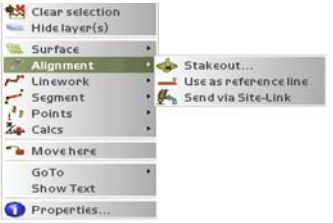


Figure 1-13. Context Menu – Alignment Options

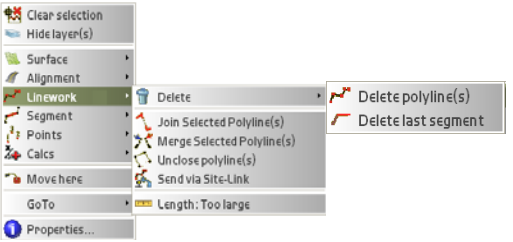


Figure 1-14. Context Menu – Linework Options

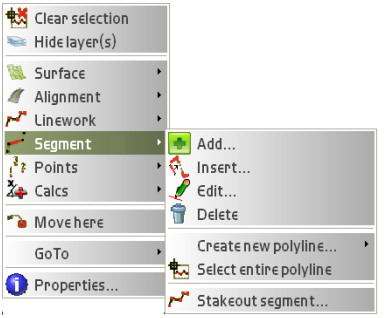


Figure 1-15. Context Menu – Segment Options

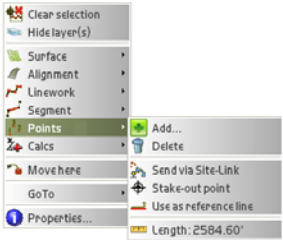


Figure 1-16. Context Menu – Points Options

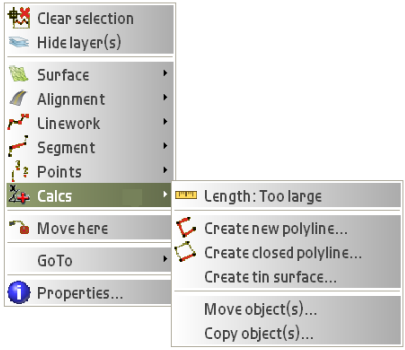


Figure 1-17. Context Menu – Calcs Options

Figure 1-18. Context Menu – GoTo Options

Toolbar

The toolbar (Figure 1-19) contains icons for frequently used functions.

Figure 1-19. Pocket-3D Toolbar – GPS Example

Table 1-1 lists and describes the available icons.

Table 1-1. Pocket-3D Toolbar Icons

Icon	Description
GPS Status mmGPS Status Total Station Status Robotic Status	GPS, LPS, mmGPS, total station status – displays symbols for the type of control application used on the jobsite, as well as the connection status (red for unconnected, green for connected, and orange for low precisions in GPS applications). • In GPS control applications, press this icon to display GPS information. See “GPS Status Information” on page 1-17 for details. • In mmGPS control applications, press this icon to display GPS information. See “GPS Status Information” on page 1-17 for details. • In total station applications, press this icon to display total station information. See “Total Station Status” on page 1-21 for details. • In robotic applications, press this icon to display robotic information. See “Robotic Survey Applications” on page 4-63 for details.
	Zoom out – decreases the magnification of the design view each time you tap this button. The zooming pivot is the center of the screen.
	Zoom in – increases the magnification of the design view each time you tap this button. The zooming pivot is the center of the screen.
	Zoom window – increases the magnification of a design area when drawing a box around the selected area.
	Zoom previous – displays the previous design view.

Table 1-1. Pocket-3D Toolbar Icons (Continued)

Icon	Description
	Zoom extents – displays the extent of the design view/area.
	Info – displays information for selected points/polylines and a dialog box to save the information as a text file.
	New Message – press to send a new message to the machine operator in the field.
	Site-Link Connection – connects you to Site-Link
Auto-pan Selection window Selection polygon Pan	Click to rotate through the four button options: • Auto-pan – tracks the user's current position in the field and displays the position as a cross symbol in the middle of the screen. Available only in GPS connection. • Selection window – selects points/polylines on the screen when drawing a box around them. • Selection polygon – selects point/polylines on the screen when drawing a polygon around them. • Pan – moves the design view around when pressing down on the screen and dragging.

Menu Bar

The menu bar provides access to the Pocket-3D configuration, setup, display, and other jobsite functions (Figure 1-20). For details on the menus, see the following:

- "Setup Menu" on page 2-1
- "Data Menu" on page 3-1
- "Survey Menu" on page 4-1
- "Display Menu" on page 5-1

Figure 1-20. Pocket-3D Menu Bar

Table 1-2 describes the functions available in each menu.

Table 1-2. Pocket-3D Menu Options

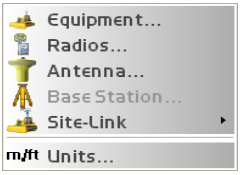
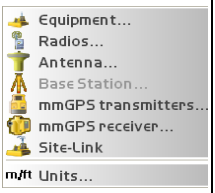
Menu	Functions
Setup Menus **GPS**  **mmGPS**  **Total Station** 	The options available in the Setup menu depend on the equipment file selected. • configures equipment and machine setups • configures radios, antennas, and base stations in GPS applications • configures transmitters and receivers in mmGPS applications • configures GRT-2000 setup and LS-2000 receivers in LPS applications • configures total stations and prisms in total station applications • sets the units for the job • Connect to Site-Link
Data Menu 	The options available in the Data menu depend on the equipment file and design surface file selected. • creates, configures, and sets control point files • creates, configures, and sets surface files • creates, configures and sets linework files • creates, configures and provides access to importing or exporting control, files, point files, and Site-Link files. • performs various calculations

Table 1-2. Pocket-3D Menu Options (Continued)

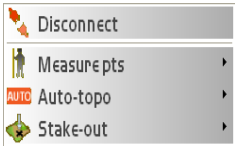
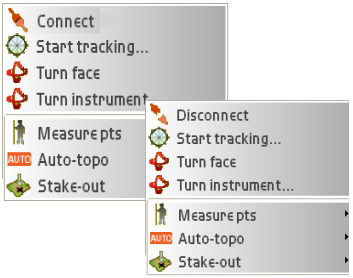
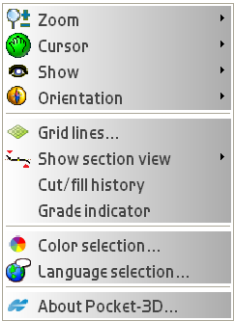
Menu	Functions
Survey Menu  **GPS** **mmGPS** **Total Station**  	The options available in the Survey menu depend on the equipment file selected. • connects and disconnects the GPS receiver or total station • starts and stops tracking the total station in total station applications • sets the type of connection for the total station • enables and disables the use of a reflectorless total station in total station applications • measures points and polylines in the field • performs auto-topo operations for topographic surveys (not available for some total station instruments/applications) • performs stake-outs

Table 1-2. Pocket-3D Menu Options (Continued)

Menu	Functions
Display Menu 	The options available in the Display menu depend on the equipment file selected and the types of data active. • zooms in, out, or pans around the main screen • selects points and/or polylines individually or in bunches • shows the scale bar, the direction of travel, and/or the point of reference • orients the screen to a desired direction • displays, orients, aligns grid lines as desired • shows a section view of the design surface (only available for certain surfaces) • shows the cut/fill history (available for mmGPS applications) • shows the grade indicator when an active surface displays. • changes the background color • selects the language for Pocket-3D on the next start up of program • displays the about Pocket-3D dialog box

For pop-up context menu options, see “Main Screen” on page 1-6.

Pocket-3D Technical Information

To view Pocket-3D information, press **Display ▸ About Pocket-3D**. The ***about Pocket-3D*** dialog box displays the version levels for the application program, copyright information, registration, and ID number (Figure 1-21 on page 1-17).

See “Main Screen” on page 1-6 for viewing options.

Figure 1-21. About Pocket-3D

GPS Status Information

Once connected to a GPS/mmGPS system, the status button on the toolbar turns green (GPS) or blue (mmGPS). Press the status button to view or edit the different application-specific parameters (Figure 1-22 on page 1-18).

GPS Status

While in GPS control, to view GPS information, change the mask angle or reset the receiver, press the **GPS status** button on the toolbar. The ***GPS status*** dialog box displays (Figure 1-22 on page 1-18).

The color of the button and state of the hardware symbol indicates the status of the system.

- Background color – green means the entire system communicates with Pocket-3D; red means all or some part of the system is not communicating with Pocket-3D; orange means low precisions.
- Hardware symbol state – if the symbol is crossed out, the corresponding sensor/receiver is not available. If the radio link is between 3 and 10 seconds old, the radio icon will flash (bad or weak signal); after 10 seconds, it will be crossed out (unavailable signal).

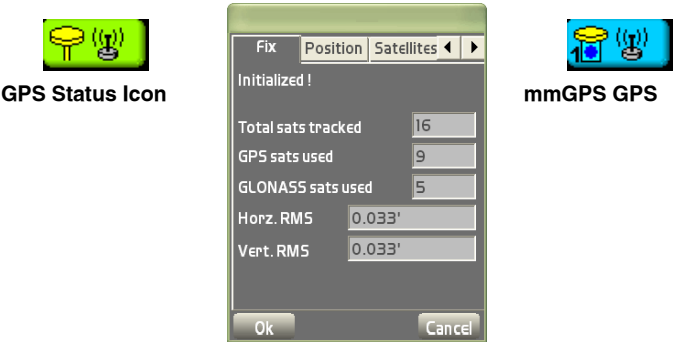


Figure 1-22. GPS/mmGPS Status Button and Dialog Box

Monitor GPS Status Information

To monitor the fix status of the GPS+ receiver, press the **GPS status** button. The ***Fix*** tab displays the following information (Figure 1-22):

- The initialization status of the GPS+ and mmGPS system
- Total sats tracked – the total (GPS and GLONASS) number of satellites being tracked
- GPS sats used and GLONASS sats used – the number of GPS and GLONASS satellites being used
- Horz. RMS and Vert. RMS – an estimation of the positioning quality computed from a valid satellite status (RMS = Root Mean Square)

View the Receiver's Current Position

To view the current position of the GPS+ receiver, press the **GPS status** button, then tap the ***Position*** tab on the ***GPS status*** dialog box.

The ***Position*** tab displays the following information (Figure 1-23 on page 1-19):

- latitude, longitude, and ellipsoid height of the GPS+ antenna
- northing, easting, and elevation of the GPS+ antenna
- the distance from the receiver to the base station

Monitor Satellites and Enter the Mask

To monitor the current distribution of satellites or enter the mask angle for satellites, press the **GPS status** button, then tap the ***Satellites*** tab on the ***GPS status*** dialog box.

The ***Satellites*** tab displays the following information (Figure 1-23).

- Satellite plot – displays used and unused satellites, and the current mask angle.
  - Blue dots: GPS satellites
  - Red-with-cross dots: GLONASS satellites
  - Black dots: unused satellites
  - Red mask circle: satellites inside will be used for positioning
- Mask – enters and sets the mask angle for the job.

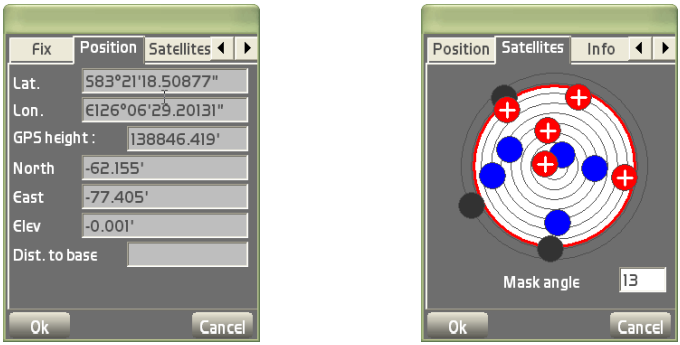


Figure 1-23. Position and Satellites Tabs

View Receiver Information or Reset Receiver

To view the receiver's ID number and firmware version, press the **GPS status** button, then tap the ***Info*** tab on the ***GPS status*** dialog box. Use the left/right arrows to navigate to the ***Info*** tab.

The ***Info*** tab displays the following (Figure 1-24 on page 1-20):

- Identification information, firmware revision, and radio link information (type, latency, and quality) for the receiver.
- Reset receiver – press to clear all data and reset all settings stored for the GPS+ receiver.

- Reset RTK – press to reset RTK ambiguities.

View PDOP Values

To view PDOP values for planning purposes, press the **GPS status** button, then tap the ***Planning*** tab on the ***GPS status*** dialog box. Use the left/right arrows to navigate to the ***Planning*** tab.

The ***Planning*** tab displays PDOP information at an hourly scale and covers a 24-hour period (Figure 1-24).

- Press **Next** to display PDOP values for the next day.
- Press **Previous** to display PDOP values for past days.

Figure 1-24. Info and Planning Tabs

Apply GPS Receiver Settings

To apply advanced GPS receiver settings, press the **GPS status** button, then tap the ***Advanced*** tab (Figure 1-25 on page 1-21) on the ***GPS status*** dialog box. Use the left/right arrows to navigate to the ***Advanced*** tab.

The ***Advanced*** tab contains the following GPS receiver settings.

- Use multipath reduction – leave enabled to reduce multiple reflections from nearby objects.
- Use GLONASS satellites – leave enabled to include in position calculations and to display on the satellite plot.
- Base Manufacturer – from the drop-down box, select which GPS station manufacturer to use, i.e., Sokkia, Ashtech, Javad, Leica,

Magellan, Trimble, etc. This helps with correct RTK operation where GLONASS is used at the base and rover where the base is not a Topcon base.

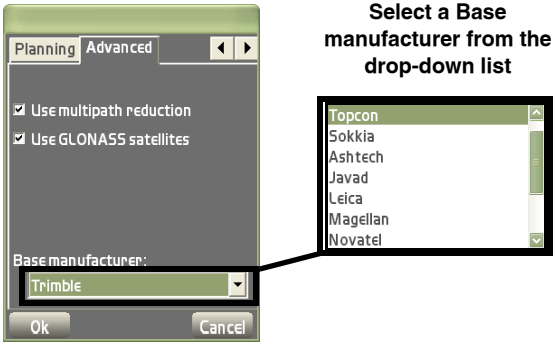


Figure 1-25. Advanced Tab

Total Station Status

While in total station control, to view total station information, change search area or change track sensitivity and speed, press the **Total Station status** button on the toolbar (Figure 1-26 on page 1-22).

The color of the button and state of the hardware symbol indicates the status of the system.

- Background color – green means the entire system communicates with Pocket-3D; red means all or some part of the system is not communicating with Pocket-3D.
- Hardware symbol state – if the symbol is crossed out, the corresponding sensor/receiver is not available.

For non-robotic total stations, the prism symbol will remain crossed out.

The instrument selected during equipment setup determines the tabs that display.

Total Station Status Icon

Figure 1-26. Total Station Status Button and Dialog Box

Monitor Prism Position Information

To monitor the position status of the prism, press the **Total Station status** button. The ***Position*** tab displays the following information (Figure 1-26):

- whether or not the prism is connected and tracks the total station
- horizontal/vertical angles and slope distance to the prism
- northing, easting, and elevation of the prism

Set Total Station Search Parameters

To set total station search parameters, press the **Total Station status** button, then tap the ***Search*** tab on the ***total station status*** dialog box (Figure 1-27 on page 1-23).

Depending on the total station used and the sensor type, enter or select the following information (Figure 1-27 on page 1-23) and press **Ok**:

- Search wait (secs) – sets the wait time in seconds until the total station starts to search for the prism (robotic total stations only).
- Pattern – selects the pattern for tracking the prism.
- Search area left and right of prism – when enabled, sets the search area at the total station for tracking the prism.

- Above and below prism – enter the angle above and below the prism in which to search.

Set Total Station Tracking Sensitivity and Speed

To set total station tracking parameters (Figure 1-27), press the **Total Station status** button, then tap the ***Track*** tab on the ***total station status*** dialog box.

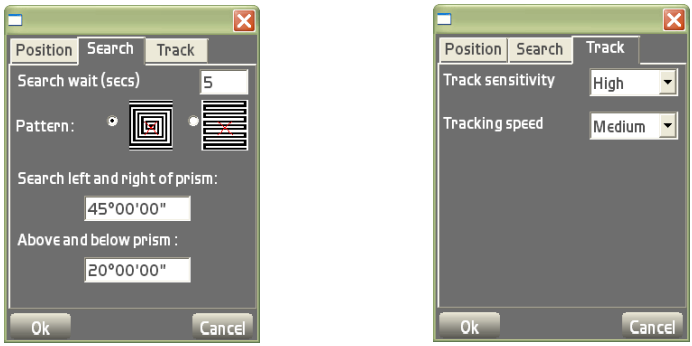


Figure 1-27. Search/Track Tabs for Total Station

Notes:

Setup Menu

Depending on the application (GPS, mmGPS, or total station), the Setup menu contains different options for configuring system components.

GPS Applications

In GPS applications, the Setup menu (Figure 2-1) has the following menu items. Some menu items depend on the type of equipment configured (machine or rover).

- Equipment
- Radios
- Antenna
- Base Station
- mmGPS transmitters (mmGPS application)
- mmGPS receiver (mmGPS application)
- Units

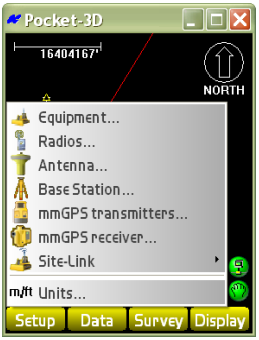


Figure 2-1. Setup Menu for GPS Applications

Equipment

The Equipment menu creates and edits equipment configuration files. Equipment configuration files contain information specific to the equipment; such as, machine type, receiver type and location, dimensions of the cutting edge, offset lengths depending on the position of the receiver, and radio configuration.

NOTICE

Equipment setup is used for Rover setups, not Base station setups.

To access available equipment configuration files, tap **Setup ▸ Equipment** (Figure 2-2).

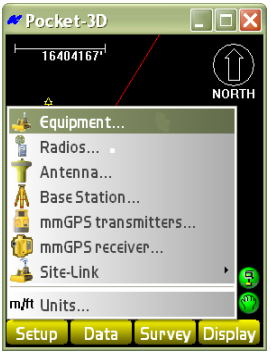


Figure 2-2. Setup ▸ Equipment

From the ***Equipment configurations*** dialog box (Figure 2-3 on page 2-3), equipment configuration files can be created within Pocket-3D and transferred to the machine Control Box to be used for machine configuration. (A machine configuration file must be created before grading.) Refer to the ***System Five-3D Reference Manual*** for more information on the Control Box.

Figure 2-3. Equipment Configurations Dialog Box

Once equipment configuration files are created and stored in the internal memory, they can be selected and adjusted at the beginning of the job, depending on the receiver's setup.

On the ***Equipment configurations*** dialog box, press **New** to display the ***Configuration name/type*** dialog box (Figure 2-4 on page 2-4) and create an Equipment Configuration file. Enter the following information and press **Next**. Some selections depend on purchased options for Pocket-3D.

- Configuration name – enter a name for the Equipment Configuration.
- Machine type – select ***Range pole, Bulldozer,*** or ***Motor grader.*** The screens display different settings depending on the machine type selection.
- Sensor – select the type of sensor used on the machine; either ***GPS antenna, GPS Augmented, mmGPS Receiver, Prism,*** or ***LS-2000 for 3-track curb & gutter.***
- Location – select the sensor's location, either ***Top of pole for Range pole, Middle for Bulldozer,*** or ***Left/Right for Motor grader***.
- Units – select the unit of measure.

  Note: These units do not relate to job units.

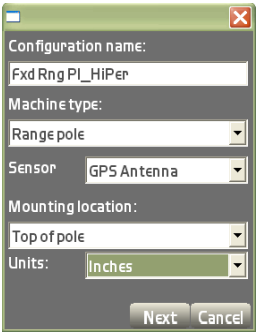


Figure 2-4. Configuration Name/Type

On the ***antenna information*** dialog box, enter the following information using the same units of measure entered in the previous step and press **Next**. These settings have a corresponding ***Image*** tab to illustrate the setup.

For range poles, enter the following antenna information (Figure 2-5):

- Antenna type – select the type of antenna.
- Antenna height – enter the antenna height of the GPS+ antenna from antenna measurement point to pole tip.
- Measured to – enter where on the GPS+ antenna the antenna height was measured.
- Connection (Pocket-3D) – select the communication port used between controller and instrument.

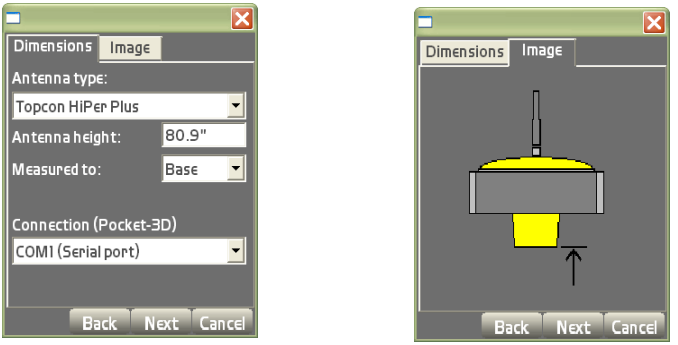


Figure 2-5. Range Pole Antenna Setup Information

On the ***radio setup*** dialog box (Figure 2-6), set the following parameters and press **Next**:

- Radio type – the type of radio.
- Connected – the port used for radio connection.
- Baud rate – the speed of communication rate between the radio unit and the GPS+ receiver.
- Format – current GPS+ systems are capable of either CMR or RTCM corrections.

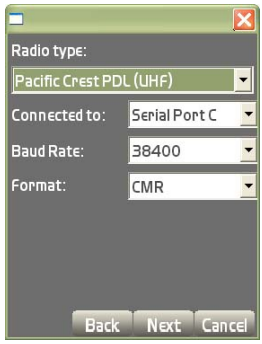


Figure 2-6. Radio Setup

On the ***Machine configuration complete*** dialog box (Figure 2-7), press **Finish** to save the configuration file.

Figure 2-7. Machine Configuration Complete Dialog Box

Radios

To configure radio settings, tap **Setup ▸ Radios** (Figure 2-8).

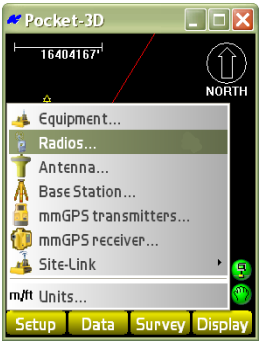


Figure 2-8. Setup ▸ Radio

On the ***radio setup*** dialog box, set the following parameters and press **Ok** (Figure 2-9 on page 2-7):

- Radio type – the type of radio.
- Port – the port used for radio connection.
- Baud rate – the speed of communication rate between the radio unit and the GPS+ receiver.
- Format – current GPS+ systems are capable of either CMR or RTCM corrections.
- **Configure** – changes the radio channel; press to display the ***channel configuration*** dialog box (Figure 2-9 on page 2-7). Select the desired channel and the corresponding Frequency displays. Press **Set** to apply the radio channel parameters.

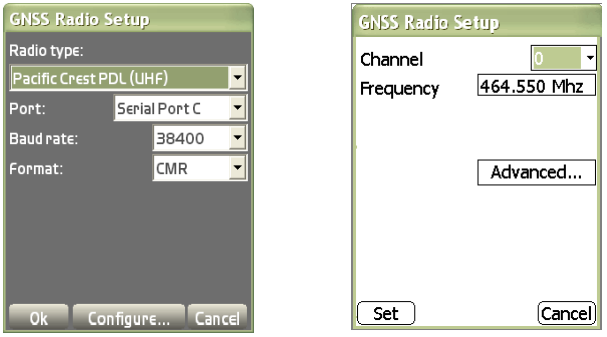


Figure 2-9. Radio Setup and Channel Configuration Dialog Boxes

Antenna

To edit/view antenna measurements, tap **Setup ▸ Antenna** (Figure 2-10).

Figure 2-10. Setup ▸ Antenna

On the ***antenna setup*** dialog box, set the following parameters and press **Ok** (Figure 2-11 on page 2-8):

- Antenna type – select the type of antenna.
- Antenna height – enter the antenna height of the GPS+ antenna.
- Measured to – enter where on the GPS+ antenna the antenna height was measured.
- Units – select the unit of measure.

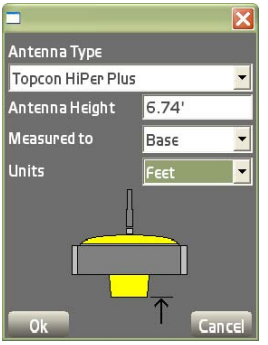


Figure 2-11. Antenna Setup

Base Station

To set Base Station information, tap **Setup ▸ Base Station** (Figure 2-12).

If the Base station menu item is unavailable, disconnect from the GPS receiver (Survey ▸ Disconnect from GPS).

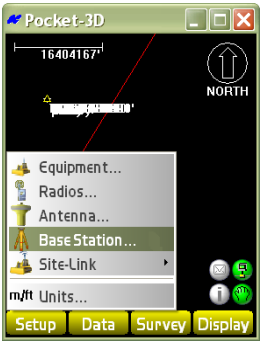


Figure 2-12. Setup ▸ Base Station

On the ***base station configuration*** dialog box (Figure 2-13 on page 2-9), set the following parameters and press **Next**:

- Control point – select the appropriate control point for the base position from the ***control point*** drop-down list.

- Connection (Pocket-3D) – select the connection to the receiver.

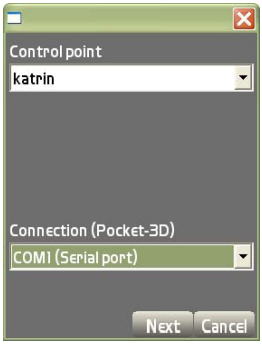


Figure 2-13. Base Station Configuration

On the ***antenna setup*** dialog box (Figure 2-14), set the following parameters and press **Ok**:

- Antenna type – select the type of antenna.
- Antenna height – enter the antenna height of the GPS+ antenna.
- Measured to – enter where on the GPS+ antenna the antenna height was measured.
- Units – select either meters, feet, inches, or centimeters.

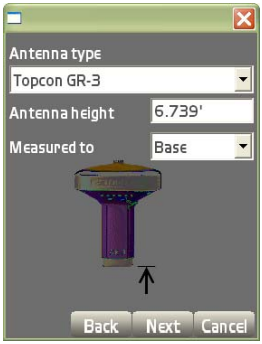


Figure 2-14. Antenna Setup – Base Station

On the ***radio setup*** dialog box, set the following parameters (Figure 2-15):

- Radio type – the type of radio.
- Port – the port used for radio connection.
- Baud rate – the speed of communication rate between the radio unit and the GPS+ receiver.
- Format – current GPS+ systems are capable of either CMR or RTCM corrections.
- **Configure** – changes the radio channel; press to display the ***channel configuration*** dialog box (Figure 2-15). Select the desired channel and the corresponding Frequency displays.
- **Set** – press to apply the radio channel parameters.
- **Next** – press to display the ***GPS receiver settings*** dialog box (Figure 2-16 on page 2-11).

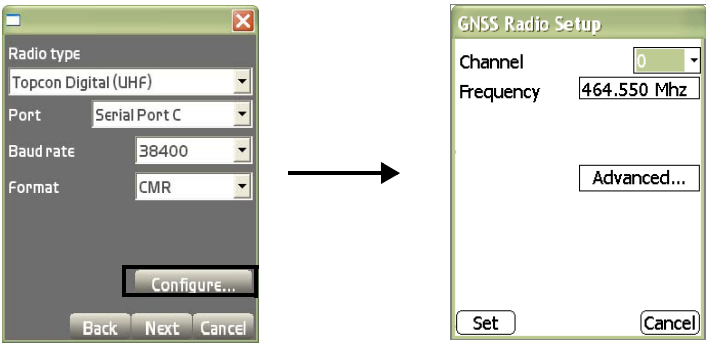


Figure 2-15. Radio Setup and Channel Configuration Dialog Boxes

On the ***GPS receiver settings*** dialog box (Figure 2-16 on page 2-11) do the following and press **Finish** to connect to the GPS receiver.

- Use co-op tracking – if enabled, allows higher efficiency of multipath reduction. This option is only valid for a base station receiver (non-moving).
- Use multipath reduction – if enabled, reduces multiple reflections from nearby objects.

- Use GLONASS satellites – if enabled, these satellites will not be included in the position calculations and will not display on the satellite plot if disabled.

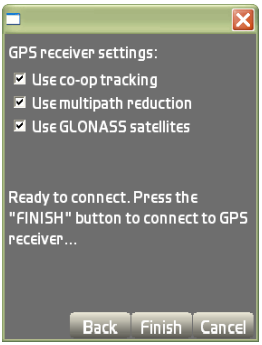


Figure 2-16. Select GPS Receiver Settings

Units

To set project units, tap **Setup ▸ Units** (Figure 2-17).

Figure 2-17. Setup ▸ Units

On the ***units*** dialog box (Figure 2-18 on page 2-12), select the desired units for each item from the drop-down lists. Press **Ok** to continue; Pocket-3D saves the entered units.

The units can be changed at any time; Pocket-3D automatically saves the changes.

- Distances – select either ***Meters***, ***US Survey feet***, ***International feet***, or ***Feet + Inches***.

If using Feet+Inches, all values will show as 1'11"1/2 where 12 inches equal 1 foot and any value smaller than an inch will show as a fraction of an inch.

- Decimal Places – select either ***0, 1, 2, 3,*** or ***4*** decimal places.
- Angles – select either ***DD°MM'SS"***, ***NDD°MM'SS"E***, ***Gons***, or ***DD.DDDD°***.
- Areas – select either ***Square meters***, ***Square feet***, ***Acres***, or ***Hectares***.
- Volumes – select either ***Cubic meters*** or ***Cubic yards***.
- Coords – select either ***North-East-Elev***, ***East-North-Elev***, ***X-Y-Z***, or ***X-Y-Z South Azimuth***.
- Stations – select either ***100.000***, ***1+00.000***, ***10+0.000***, or ***1+000.000***.
- Grades – select either ***Percent (%)***, ***Run : Rise***, or ***Rise : Run***.

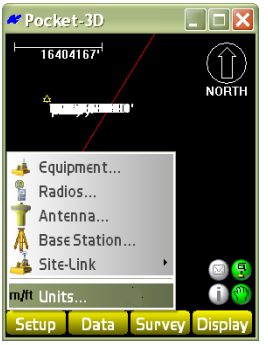


Figure 2-18. Units Parameters

Exit

To exit Pocket-3D, tap the icon in the upper-right corner of the screen.

Equipment Configuration Files

Equipment configuration files contain information on the specific machine, GPS+ receiver, prism, radio, etc., for the job application and setup. Pocket-3D uses this information to accurately portray jobsite information on the main screen.

The following sections provide example equipment configurations: one for a range-pole with a HiPer® Lite receiver, one for a motor grader machine rover with mmGPS, one for a motor grader with an LS-2000 receiver, and another one for a prism/total station setup.

An equipment configuration file can be created in one of two ways:

- Import the file created at the System Five-3D Control Box through the compact flash card using the **Copy** button. See "Project" on page 3-2 for details.
- Create the file manually.

Sample Configuration 1: Range-pole with HiPer Lite Receiver

Before initializing or localizing a GPS+ system, there must be an equipment configuration file defined in Pocket-3D. The following procedure is an example of a HiPer Lite receiver configuration.

Incorrect measurements or typographical errors will have a direct affect on grading accuracy.

1. Press **Setup ▸ Equipment.** The ***Machine files*** dialog box displays.
2. On the ***Machine files*** dialog box, press **New** to create (or **Edit** to change a selected file) an equipment configuration (Figure 2-19 on page 2-14).
3. On the ***Configuration name*** dialog box, set the following equipment parameters, and press **Next** (Figure 2-19 on page 2-14):

- Configuration name – enter a name for the Equipment Configuration file on the alphanumeric pop-up keyboard.
- Machine type – select ***Range pole*** from the drop-down list.
- Sensor – select ***GPS Antenna*** from the drop-down list.
- Mounting location – select ***Top of pole*** from the drop-down list.
- Units – select the type of unit measurement from the drop-down list.

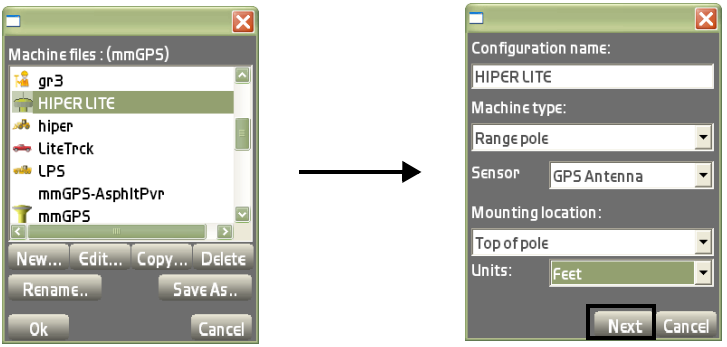


Figure 2-19. Equipment Configuration Dialog Box

4. Enter the following information on the ***Dimensions tab*** using the same units of measurement entered in the previous step, then press **Next** to continue (Figure 2-20). These settings have a corresponding ***Image*** tab to illustrate the setup.
   - Antenna type – select ***Topcon HiPer Lite***.
   - Antenna height – enter the antenna's measured height.
   - Measured to – select either ***Base*** or ***Rim***.
   - Connection (Pocket-3D) – select the appropriate connection.

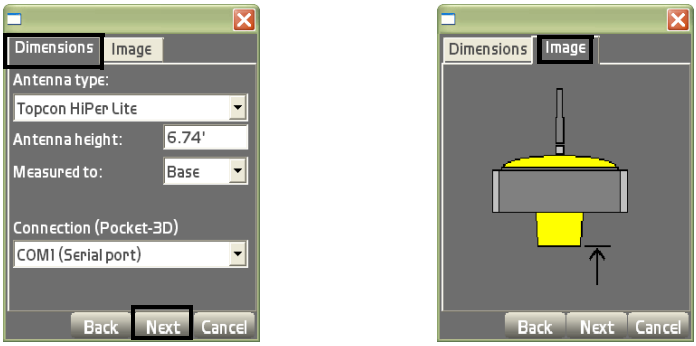


Figure 2-20. Antenna Information – Dimensions/Image Tab

5. On the ***advanced*** dialog box (Figure 2-21), set the following radio parameters, and press **Next** to continue:
   - Radio type – for a HiPer Lite, the default is selected; otherwise, select the radio type for the receiver.
   - Connected to – select serial port (usually Port C) from the drop-down list.
   - Baud rate – select 38400 from the drop-down list.
   - Format – select CMR from the drop-down list.
6. On the ***confirmation screen***, press **Finish** to save the configuration file (Figure 2-21).

   Pressing Cancel will cause the configuration's information to be lost.

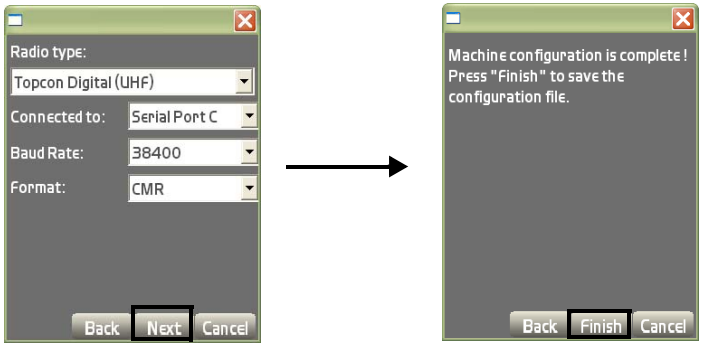


Figure 2-21. Radio Setup Dialog Box

7. On the ***Equipment configuration*** dialog box, highlight the new or edited configuration file, and press **Ok** to return to the Main Screen (Figure 2-22).

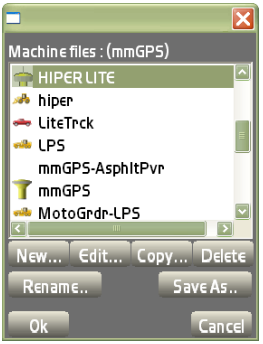


Figure 2-22. Select Equipment Configuration

GPS Augmented Sensor Type Now you can select a GPS (Augmented) sensor type, which allows you to run without RTK corrections (or without RTK options in your receiver) and to perform rough grade-checking and stakeout using GPS positions computed with the help of the WAAS (North America) or EGNOS (Europe) GPS augmentation system. The expected position accuracies can range from anywhere between 0.5' and 4.0' (0.2m and 1.5m) depending on satellite availability.

Sample Configuration: GPS Augmented Sensor Type The following procedure is an example of selecting GPS (Augmented) as the sensor type for GPS.

1. Follow steps 1 & 2 above, then on the ***Configuration name*** dialog box, select GPS (Augmented) as the sensor type, and press **Next.**
2. On the ***Dimensions*** tab (Figure 2-23 on page 2-17), select the antenna type, enter antenna height, measure to either the ***Base*** or the ***Rim***, and select the appropriate connection for Pocket-3D. The corresponding ***Image*** tab illustrates the setup.

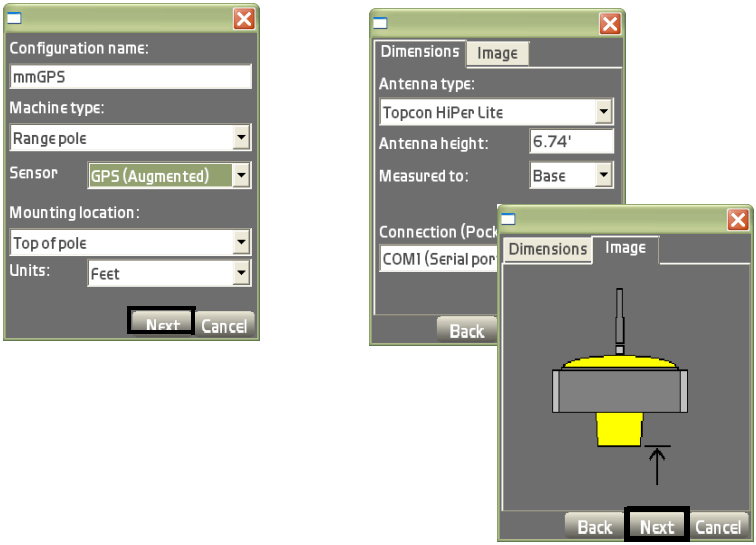


Figure 2-23. Example – GPS (Augmented) Equipment Configuration

3. Press **Next** to display the ***confirmation screen*** dialog box (Figure 2-25).
4. Press **Finish** to return to the ***Machine files*** dialog box (Figure 2-24).

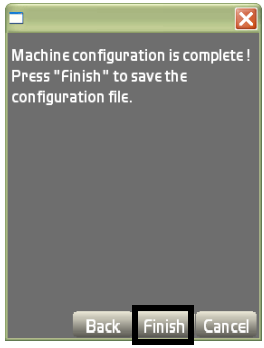


Figure 2-24. Machine Configuration Complete

5. On the ***Machine files*** dialog box (Figure 2-25), select the new or edited configuration file and press **Ok**.

6. On the Machine files dialog box (Figure 2-25*)*, press **Ok** to apply the configuration file as the current equipment.

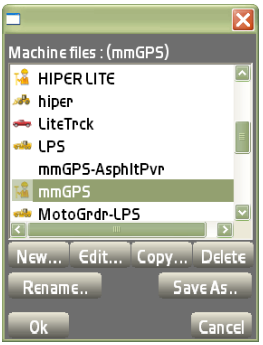


Figure 2-25. Select Equipment Configuration

mmGPS Applications

In mmGPS applications, the Setup menu (Figure 2-26) has the following additional menu items. Except for mmGPS setup options, the Setup menu for mmGPS applications is the same as for GPS applications. Other differences are noted below.

- mmGPS transmitters
- mmGPS receiver

mmGPS Icon

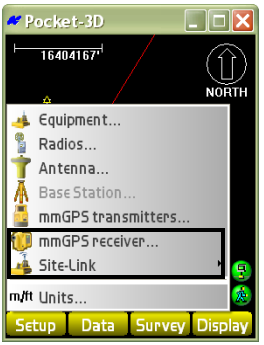


Figure 2-26. Setup Menu for mmGPS Applications

Equipment

For further details on the Equipment menu option and setup screens, see “Equipment” on page 2-2. During rover equipment setup for mmGPS applications, an additional screen configures GPS connections; machine setups for mmGPS remains the same.

mmGPS Transmitters

Transmitter calibration data must first be downloaded into Pocket-3D using the ***Transmitters*** tab (Figure 2-28 on page 2-20). Once this tab contains a list of transmitters, up to four transmitters can be set up on unique channels using the channel tabs (see below). The channel button on the transmitter determines the channel that the transmitter broadcasts on.

To set up transmitter information, tap **Setup ▸ mmGPS transmitters** (Figure 2-27).

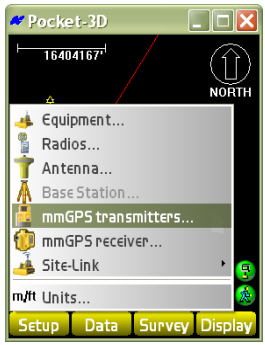


Figure 2-27. Setup ▸ mmGPS Transmitters

The Transmitters tab performs the following (Figure 2-28 on page 2-20):

- **To select a Serial Cable** – select the communication port used between the controller and transmitter; either COM or Bluetooth® comport.
- **To add a transmitter** – tap **Add** and enter a transmitter serial number or other description.
- **To delete a transmitter** – select a transmitter and tap **Delete**.

- **To calibrate the transmitter** – see "TX Calibration" on page 2-21.
- **To load transmitter data for the first time** – tap **Download** to retrieve calibration data from the connected transmitter.

  The download is complete when the firmware version displays in the ***Firmware*** column.

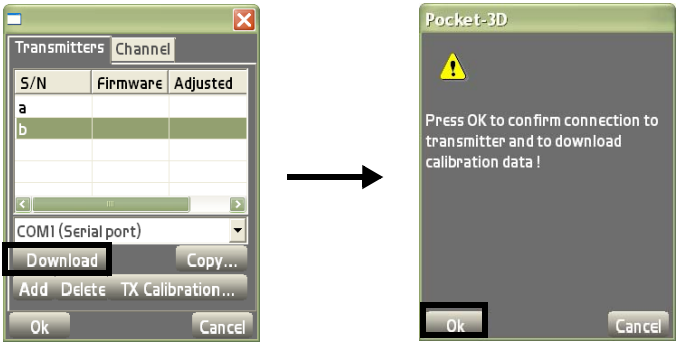


Figure 2-28. View Transmitters Loaded into Pocket-3D

The Channel tab displays the following transmitter information (Figure 2-29 on page 2-21):

- Channel – the channel the transmitter is using.
- Transmitter – the ID of the transmitter.
- ControlPt. – the control point over which the transmitter is set up.
- Height – the height of the transmitter.
- **Edit Channel** – see "Edit Channel" on page 2-23.

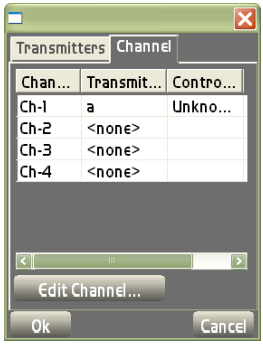


Figure 2-29. Enter Transmitter Channel Information

TX Calibration

The transmitter calibration (adjustment) function fixes errors in incline in the self-leveling mechanism of the transmitter, applying an offset to the transmitter. The transmitter must be in calibration mode for this function and the Rover setup approximately 30 meters (100 feet) away. The height of the sensor must be at an angle less than 1° in relation to the transmitter.

NOTICE

If the sensor experiences excessive movement during any stage of the adjustment, an error message will display. Press Cancel and stabilize the Rover pole. Then press TX calibration again.

To begin a resection, tap **TX Calibration** on the ***Transmitters*** tab of the ***transmitter setup*** dialog box. If needed, check the setup listed on-screen (Figure 2-30 on page 2-22) and tap **OK**.

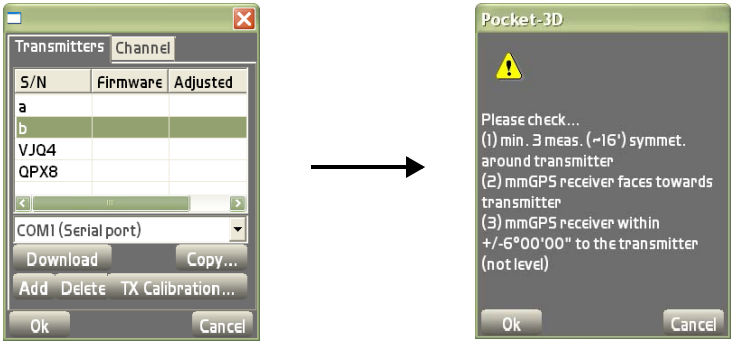


Figure 2-30. Begin TX Calibration Adjustment

On the ***transmitter adjustment process*** dialog boxes (Figure 2-31), follow the instructions on each screen. Press **Next** to continue.

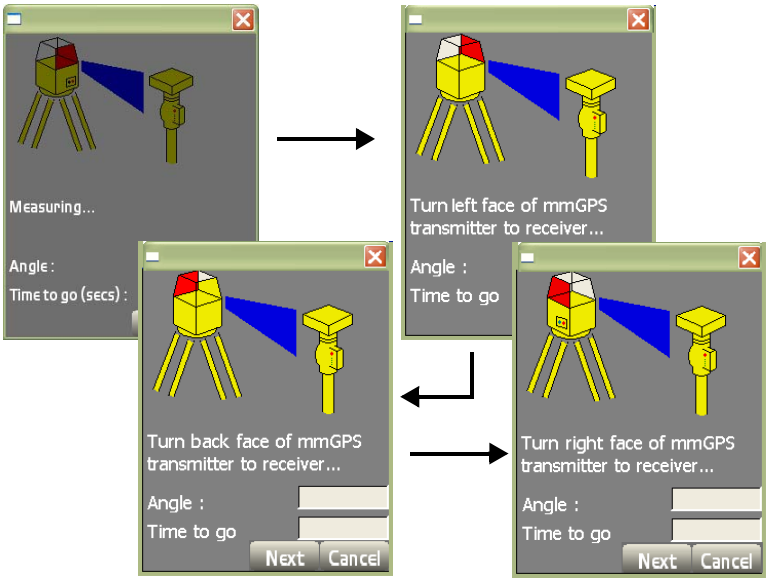


Figure 2-31. Transmitter Adjustment Process

When the adjustment completes, the ***Adjustment*** dialog box displays the offsets (Figure 2-32 on page 2-23).

- If both ***Axis*** measurements are less than 10", no adjustment is needed at the transmitter.

- If either or both ***Axis*** measurements are more than 10", disconnect from the sensor and connect to the transmitter.
- Press **Finish** to upload the adjustments to the transmitter. When finished uploading, the transmitter will apply the adjustments and turn off.

After loading the new self-leveling offset data into the transmitter, re-calibrate to check the system. The transmitter may need to be calibrated a couple of times depending on site conditions.

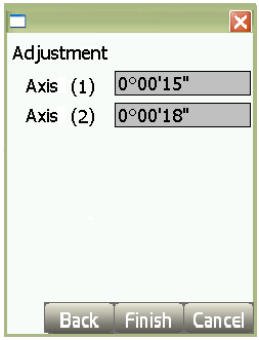


Figure 2-32. Adjustment Results

This process only applies an offset to the self-leveling mechanism to ensure correct grade. The control point file is not affected.

Edit Channel

To edit information for the selected transmitter, tap the **Edit Channel** button on the ***Channel*** tab (Figure 2-33 on page 2-24).

On the ***edit channel*** dialog box, edit and select the following parameters and press **Ok** to save (Figure 2-33 on page 2-24).

1. Transmitter – select the desired transmitter from the drop-down list.
2. Control point – select the control point for the transmitter's position from the drop-down list.

3. TX height – enter the height of the transmitter.
4. Measured to – select where on the transmitter (Base or Mark/ Slant) the height was measured.
5. Benchmark check – see “Benchmark Check” below.
6. Resection – see “Resection” on page 2-25.

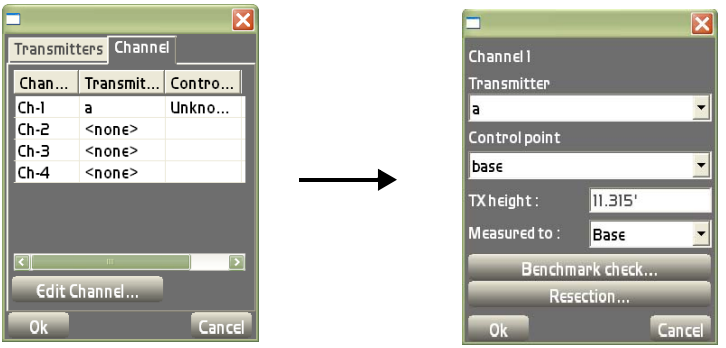


Figure 2-33. Edit Channel

Benchmark Check

This function determines the height of the mmGPS transmitter over a known control point (benchmark) or a point of known elevation.

To take a height measurement of the transmitter, tap **Benchmark check** on the ***channel setup*** dialog box after entering transmitter information (Figure 2-34).

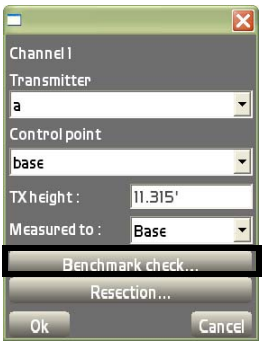


Figure 2-34. Begin Height Check

On the ***transmitter height*** dialog box, select one of the following and press **OK** to measure (Figure 2-35). During the measurement, the ***Measuring*** dialog box displays.

1. If the transmitter is set up over a known control point, tap the first radio button, then select the control point from the drop-down list.
2. If the transmitter is set up over a point with a known elevation press the second radio button, then enter the elevation of the Rover receiver.

When done, the ***Transmitter height*** fields display the vertical difference between the height originally specified for the transmitter and the calculated height (Figure 2-35).

3. Press **OK** to apply the measured height to the transmitter setup.
4. Press **Cancel** to exit without saving the measurement.

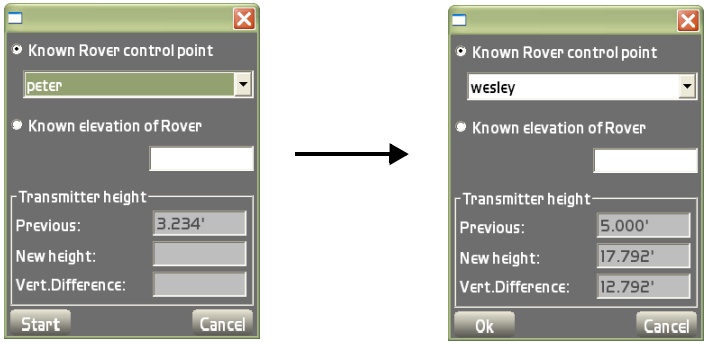


Figure 2-35. Measure Height of Transmitter

Resection

The resection function measures an unknown transmitter location using the rover and three or more points. In general, the results from a resection are adequate for horizontal positioning of the transmitter (an error estimate will also display). Performing a height check and adjustment will fine-tune the calculated elevation.

When performing a resection, use the following guidelines to ensure accurate measurements at the Rover points:

- take measurements at three or more points around the Base transmitter in a balanced, symmetrical pattern (not clustered in one area)
- have the sensor facing towards the transmitter during each measurement
- angle the sensor between 6° higher or lower than the transmitter's beam, not straight on

To begin a resection, press the **Resection** button on the ***channel setup*** dialog box (Figure 2-36).

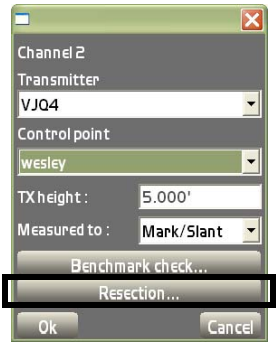


Figure 2-36. Begin Resection

On the ***resection*** dialog box, enter the following parameters and press **Measure** (Figure 2-37 on page 2-27). During the measurement, the ***Measuring*** dialog box displays. When done, the ***Pts. in calculation*** field will increment by one.

- Duration (secs) – enter the duration, in seconds, in which to measure the point.
- H. Precision / V. Precision – enter a horizontal / vertical precision, in the project's units, with which to measure the point.
- **Measure** – After three points have been successfully measured, horizontal and vertical errors for the measured point will display (Figure 2-37 on page 2-27). Further measurements should improve the positional error.
- **Reset** – press to clear measurements and start again.

The point name will be automatically added to the list of control points as “TX-[n] (Resected)”, where “***n***” is the channel number. Subsequent resections with the same transmitter will overwrite any previous points.

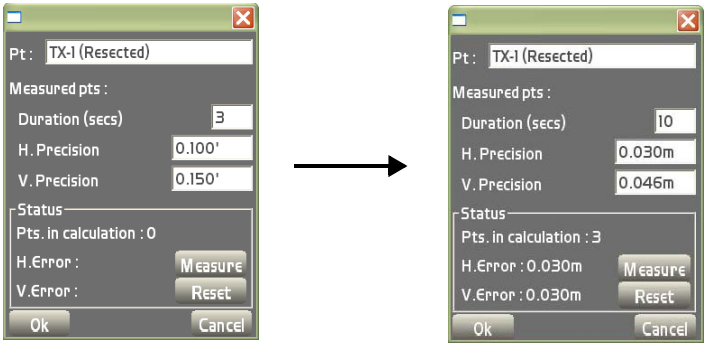


Figure 2-37. mmGPS Resection Result

mmGPS Receiver

To set mmGPS receiver information, tap **Setup ▸ mmGPS receiver** (Figure 2-38).

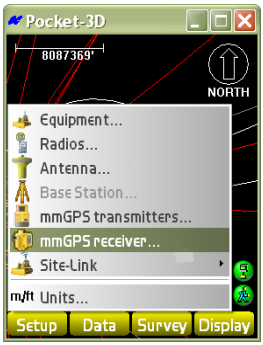


Figure 2-38. Select mmGPS Receiver Parameters

On the ***mmGPS setup*** dialog box, set the following parameters and press **Ok** (Figure 2-39 on page 2-28):

- GPS port – select the port used for communication between receiver and sensor (typically port D).

- Sensitivity – select Auto to automatically control the mmGPS receiver's detection level of the transmitter's signal.

  Select a different setting when working at very short or very long distances, or during inclement weather that can affect laser detection.

- Channels – select the channel to scan for mmGPS connection.
- Firmware – the firmware version displays after the download of calibration data from the connected transmitter completes.
- Advanced – select advanced mmGPS options:
  - mmGPS aided initialization: select to use the mmGPS signal to assist in initializing the GPS receiver.
  - Calc weighted mmGPS/GPS elevation: select to combine mmGPS elevations and GPS elevations.

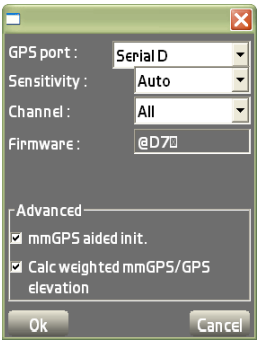


Figure 2-39. Select mmGPS Receiver Information

Total Station Applications

In total station applications, the Setup menu has a Range-pole menu item (Figure 2-40).

Total Station Icon

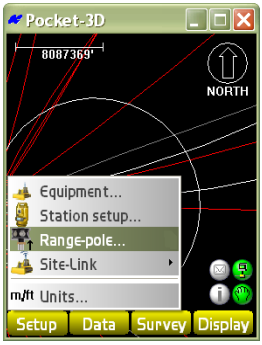


Figure 2-40. Setup Menu for Total Station Applications

Equipment

For further details on the Equipment menu option and setup screens, see “Equipment” on page 2-19.

For the range pole and total station, enter and select the following information during equipment configuration (Figure 2-41 on page 2-30), then press **Next**:

- Instrument – select the desired total station (GPT8000).
- 1. Vert. prism height – enter the vertical height of the prism.
- Prism constant – enter the prism constant. This constant is dependent on the manufacturer of the prism; usually –30 mm for a single prism and zero for a 360° prism.
- Connection (Pocket-3D) – select the ***COM1*****(*****Serial Port),*** ***COM 2 (Serial 1)***, or ***Bluetooth*** (on equipped total stations).

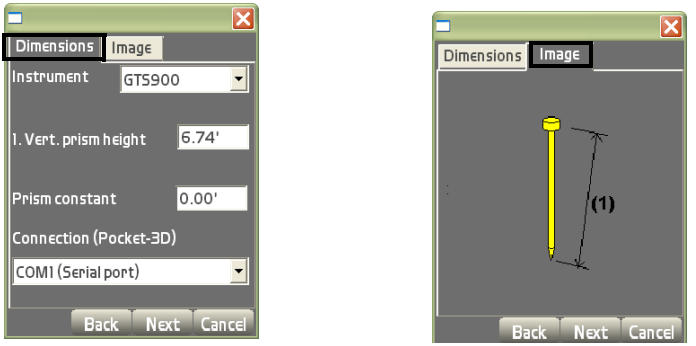


Figure 2-41. Setup/Image Tabs for Total Station

On the ***Advanced*** dialog box (for prism sensors only), select how you want to connect the total station (Figure 2-42 on page 2-31), then press **Next**.

- Cable in STD mode – select to connect the total station via serial cable or Bluetooth if the total station is in STD (standard) measurement mode.
- Cable in Ext. Link mode – select to connect the total station via serial cable or Bluetooth.
- RC4 Modem (Ext.Link) – select to connect the total station via RC4 modem if the total station is in external link mode.
- Remote Control – select to connect the total station via serial cable or Bluetooth if the total station is in external link mode.
- Baud rate – select either ***600, 1200, 2400, 4800,*** or ***9600***
- Data Bits – select either ***7*** or ***8***
- Stop Bits – select either ***1*** or ***2***
- Parity – select either ***Odd*** or ***Even***

For a conventional total station, the GTS 200 for example, you can only connect via Cable in Standard Mode.

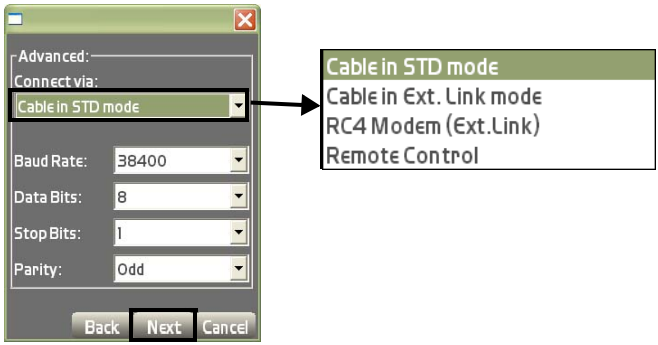


Figure 2-42. Select Total Station Connection Type

The Advanced dialog box is only available when a Prism sensor is selected.

A confirmation box displays to save the machine configuration file. Press **Finish (**Figure 2-43**)**.

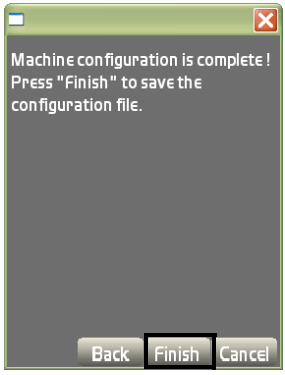


Figure 2-43. Save the Configuration

Range-pole

To set up the range pole, tap **Setup ▸ Range-pole** (Figure 2-44 on page 2-32).

On the ***range pole setup*** dialog box (Figure 2-44 on page 2-32), select or enter the following parameters and press **Ok**.

- Units – select the unit of measure.

  NOTE: These units do not relate to job units.

- Vert. dist. from prism center to pole tip – enter the measured distances for the prism and the offset.
  - Height of prism: enter the vertical height of the prism.
  - Prism offset: enter the prism offset.

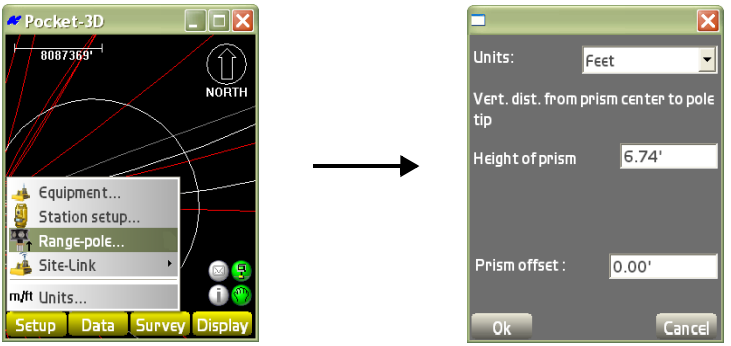


Figure 2-44. Range Pole Parameters

Sample Configuration 4: Prism and Total Station

Before beginning to track a prism, there must be an equipment configuration file defined in Pocket-3D. The following procedure is an example of a prism configuration for a GPT-8000 series total station.

1. Press **Setup** ▸ **Equipment** to create or select an equipment configuration file. The following steps describe creating a file.
2. On the ***Machine files*** dialog box, press **New** to create (or **Edit** to change) a total station configuration (Figure 2-45 on page 2-33).
3. On the ***Configuration name*** dialog box, set the following equipment parameters, and press **Next** (Figure 2-45 on page 2-33).
   - Configuration name – enter a name for the configuration file.
   - Machine type – select Range pole from the drop-down list.
   - Sensor – select prism from the drop-down list.

- Mounting location – select “Top of pole” from the drop-down list.
- Units – select the type of unit measurement from the drop-down list.

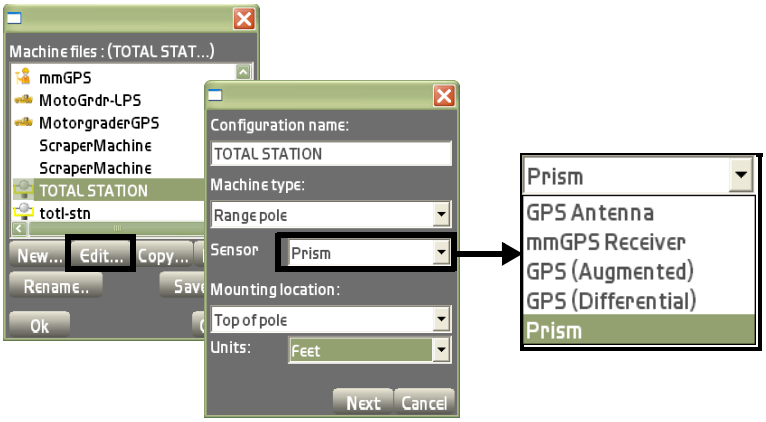


Figure 2-45. Equipment Configuration File for Total Station

4. Enter the sensor information using the same units of measure entered in the previous step, then press **Next** to continue (Figure 2-46 on page 2-34). These settings have a corresponding ***Image*** tab to illustrate the setup.
   - Instrument – select the desired total station from the drop-down list.
   - Vert. prism height – enter the vertical height of the prism.
   - Prism constant – enter the prism constant. This constant is dependent on the manufacturer of the prism; usually -30 mm for a single prism and zero for a 360° prism.
   - Connection (Pocket-3D) – select the communication port used between the controller and instrument; ***COM1 (Serial port)*** or ***Bluetooth***® on equipped total stations.

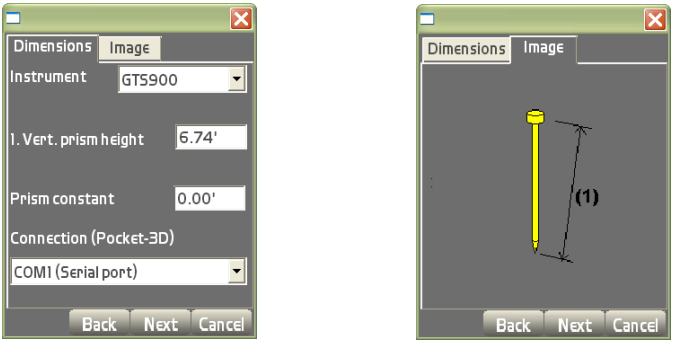


Figure 2-46. Sensor Information Dialog Box

5. On the ***Advanced*** dialog box, select the connection type, ***Baud rate, Data Bits, Stop Bits,*** and ***Parity*** used for communication with the total station and press **Next** to continue (Figure 2-47).

   NOTE: The RC4 Modem is now supported in order to communicate with robotic total stations.

6. Press **Finish** to save the configuration file (Figure 2-47).

   NOTE: Pressing Cancel will cause the configuration's information to be lost.

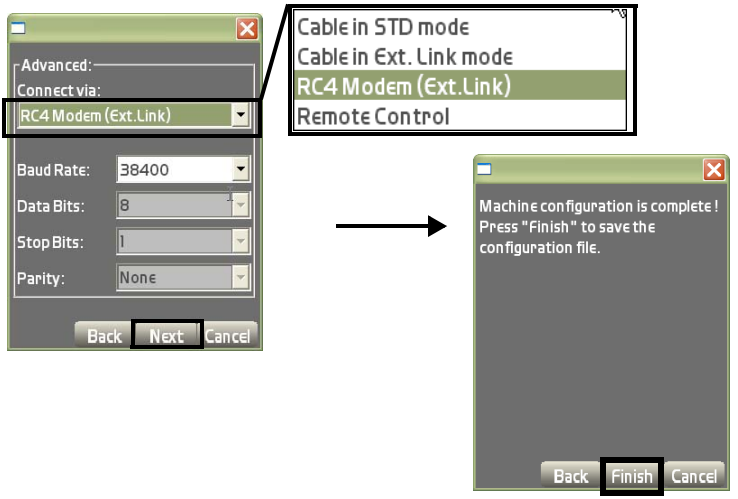


Figure 2-47. Select Advanced Parameters

7. On the ***Machine files*** dialog box (Figure 2-48), select the new or edited configuration file, and press **Ok** to return to the main screen.

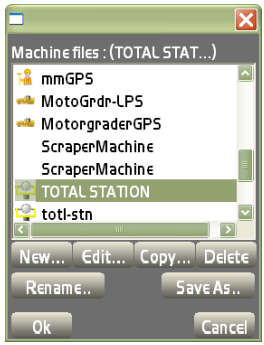


Figure 2-48. Select Equipment Configuration

Robotic Applications

The Setup menu for robotic applications is about the same as for range pole applications (Figure 2-49). The differences are noted below.

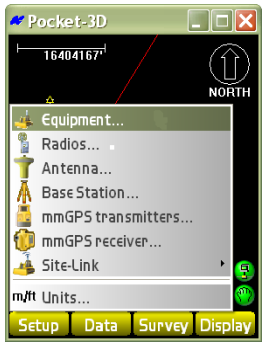


Figure 2-49. Setup Menu for Total Station Applications

Equipment

To communicate to the controller using the radio, do the following:

1. Click **Setup ▸ Equipment ▸ New**.

   The ***Configuration*** dialog box displays (Figure 2-50 on page 2-37).
2. For the range pole and robot application, enter a name for the robotic application, select ***Range pole*** as machine type, and a ***Prism*** as the sensor type.
3. Select ***GTS900MC*** as the communication port used between the controller and the instrument (Figure 2-50 on page 2-37) (or GTS900 [Figure 2-51 on page 2-37]) and connect via Radio Modem (***COM3***)((Figure 2-50 on page 2-37) or RC3/BT COM6 (Figure 2-51 on page 2-37).
4. Press **Next**.
5. The ***Setup/Image*** dialog box displays (Figure 2-50 on page 2-37).
6. Press **Next** again (the ***Advanced*** dialog box displays) to connect via the Radio Modem (Figure 2-50 on page 2-37) or the RC3 (Figure 2-51 on page 2-37).

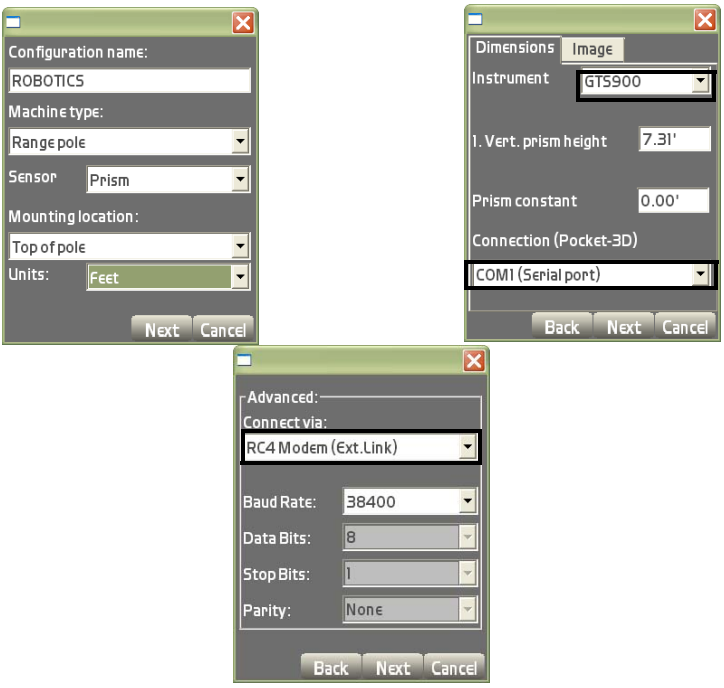


Figure 2-50. Using Radios (COM3) as Communication

The type of communication selected determines the equipment setup configuration.

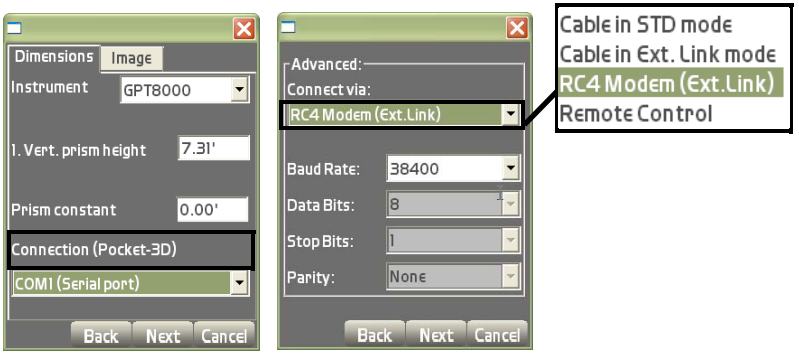


Figure 2-51. Using RC3 (BT COM6) as the Communication Device

Station Setup

To set the occupy and backsight stations of the instrument, tap **Setup ▸ Station Setup** (Figure 2-52).

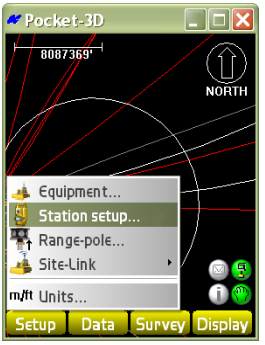


Figure 2-52. Setup ▸ Station Setup

On the ***setup method*** dialog box (Figure 2-53 on page 2-39), set the parameters for the four station setup methods: Known station & BS pt, Known station & azimuth, New station by Resection, and Unknown pts, then press **Next.**

Known station & BS pts: the most common method. Select a station point and a backsight point from the list of control points for the job site.

1. On the ***Setup method*** dialog box (Figure 2-53 on page 2-39), set the following parameters:
   - Instrument height – enter the measured height of the instrument.
   - Units – enter the units used to measure the height of the instrument, then press **Next**.

   The **backsight setup** dialog box (Figure 2-53 on page 2-39) displays.
2. On the ***backsight setup*** dialog box, select or enter the following parameters, then press **Next**:
   - Filter List – select either Control points or Point from the drop-down list.
   - Layer – select a layer from the drop-down list.

- Station – select the control point over which the instrument is set (only if 'Point' is selected in the FIlter List field above).
- Backsight – select the control point used as the backsight.
- Backsight has prism – check mark this box if the backsight has a prism.
  - Target height: enter the height of the backsight prism.
  - Prism constant: enter the prism constant for the backsight prism.

Setup Method Dialog **Backsight Setup Dialog Box**

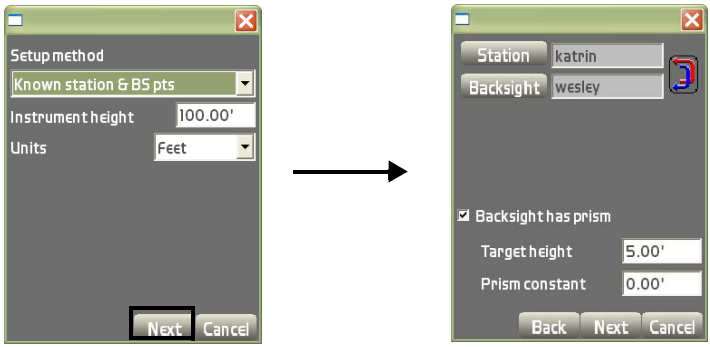


Figure 2-53. Known Station & BS Points Setup Method

Known station & azimuth select a station point from the list of control points and enter an azimuth value for the orientation.

1. On the ***Setup method*** dialog box (Figure 2-55 on page 2-40), enter instrument height and unit of measurement as described on page 2-38.

   The ***backsight setup*** dialog box displays.

2. On the ***backsight setup*** dialog box (Figure 2-55 on page 2-40), select or enter the following parameters:
   - Filter List – select either ***Control points*** or ***Point*** from the drop-down list.
   - Layer – select a layer from the drop-down list, if 'Point' was selected from the Filter List.
   - Station – select the control point the instrument is over.

- Backsight azimuth – enter the desired azimuth for the backsight.

3. Press **Ok** to continue (Figure 2-54).

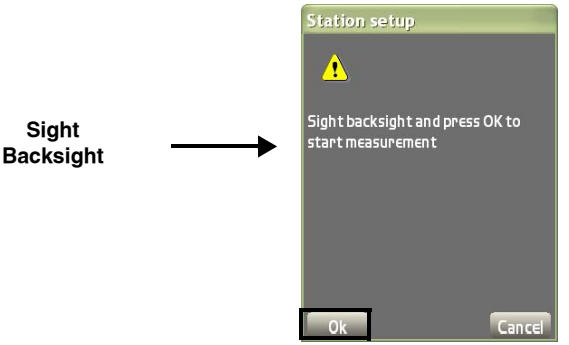


Figure 2-54. Sight Backsight Dialog Box

4. Press **Next** to display the ***sight backsight*** dialog box (Figure 2-54).

Setup method dialog box **Backsight Setup Dialog Box**

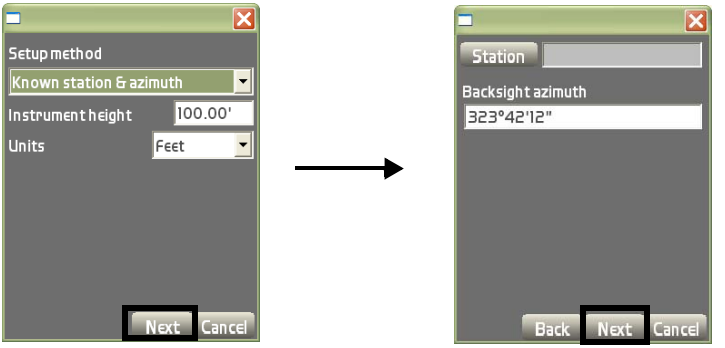


Figure 2-55. Known Station and Azimuth Setup Method

New station by resection add a control point to the resection and take a measurement to each point.

1. On the ***Setup method*** dialog box (Figure 2-56 on page 2-41), enter instrument height and unit of measurement as described above, (page 2-38) then press **Next**.

   The ***control points*** dialog box displays (Figure 2-56 on page 2-41).

2. On the ***control points*** dialog box, do the following:
   - **Add** – press to add point/control points to the resection. The ***Backsight results*** dialog box (Figure 2-57 on page 2-42) displays.
   - **Edit** – press to edit a highlighted point/control point, then press **Ok** to return to the ***control points*** dialog box.

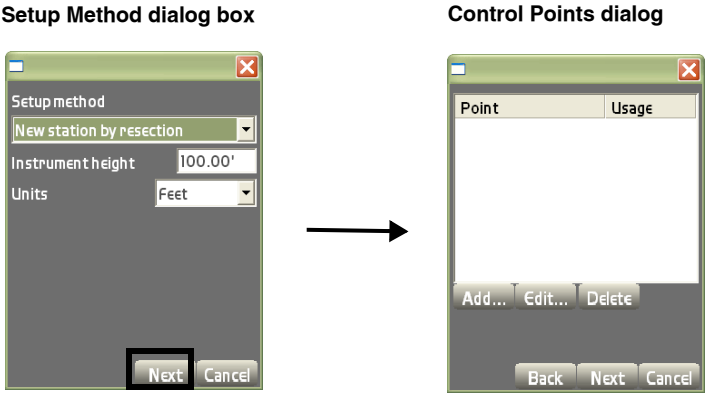


Figure 2-56. New Station by Resection Setup Method

   - **Delete** – press to delete a highlighted point/control point on the ***control points*** dialog box, then press **Ok.**

     Press **Yes** to confirm or No to cancel.

You can use any number of points, but at least 3 points should be used for an accurate resection. Once computed, add the new, resected point to the control point file.

On the ***Backsight results*** dialog box (Figure 2-57 on page 2-42), select or enter the following parameters:

- Filter List – select either Control points or Point from the drop-down list.
- Layer – select a layer file from the drop-down list, if Points was selected from the Filter List.
- Name – select the control point to be used in the resection from the drop-down list.

- Usage – select either ***H. Angle only, H.&V. Angles, H., V. Angles & SD.,*** or ***Disabled*** to specify how the control point will be used.
- HT – enter the height of the control point's prism.
- PC – enter the prism constant of the control point's prism.
- H.Angle – enter the horizontal angle difference.
- V.Angle – enter the vertical angle difference.
- S.Dist – enter the slope distance difference.
- **Observe** – press to measure the control point.

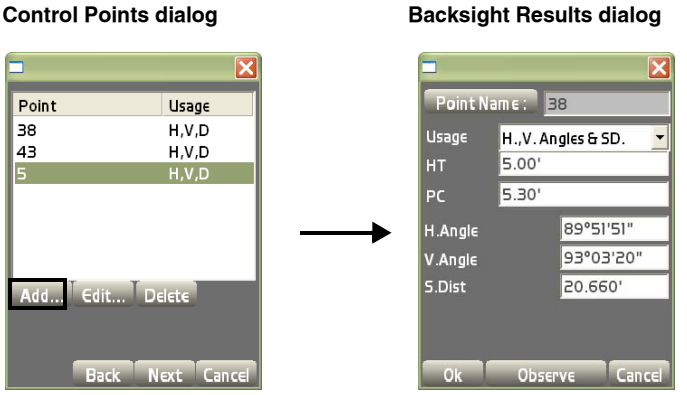


Figure 2-57. Backsight Results

Unknown point automatically creates this point in the database as point 1.

1. On the ***Setup method*** dialog box (Figure 2-56 on page 2-41), enter instrument height and unit of measurement as described above, (page 2-38) then press **Next**.

   The ***Station coordinates*** dialog box displays (Figure 2-58 on page 2-43).
2. The ***Station coordinates*** dialog box (Figure 2-58 on page 2-43) verifies the ***North(ing), East(ing),*** and ***Elev(ation)*** for the new control point.

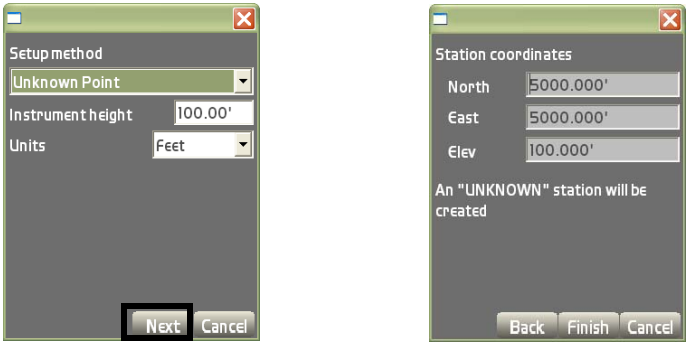


Figure 2-58. Station Coordinates Dialog Box

3. Press **Finish** to continue (Figure 2-58). The ***sight backsight*** dialog box displays.

   The ***sight backsight*** dialog box (Figure 2-59), sights the backsight.

4. Press **Ok** to continue.

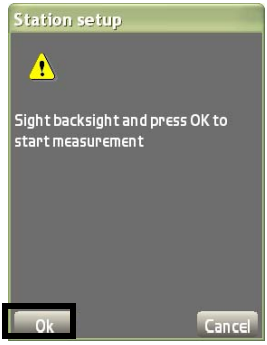


Figure 2-59. Sight Backsight

SiteLink® 3D for Pocket-3D

SiteLink-3D is an advanced communications system for Machine Control Grade Suite of products. It connects every aspect of the jobsite – the machine operator in the field, the surveyors, the grade checkers, and office personnel. The Site-Link Manager Software manages the communications network and can only be used by system administrators. Using Sitelink Manager software, the administrator initially sets up each Pocket-3D user with an operator name and specific activities and delays. Generally, Site-Link Manager allows the system administrator to:

- Save all data sent by machines from the jobsite to a database
- Send data to all people on the jobsite, i.e., machine operator survey crews, office personnel, etc., no need to use USB sticks.
- Communicate will all people on the jobsite via a messaging system – no need to stop the machine before talking to the driver in the field.
- Update design files and other data on the machine at the jobsite with the latest points, lines, etc.
- View all machines and other survey crews and their position on Pocket-3D to see what task they are currently working on – increases safety and productivity
- Troubleshoot (remotely) from the office to insure that the surveyor has the right files or if there are problems with the radio; you can also view the controller and remotely talk to the survey about any problems that arise.
- Receive real time support through the Topcon support group
- Receive GPS corrections over Sitelink
- Maintain historical data inside the database for safety and security

- Check productivity of the crew – who was working on what, how productive was the crew – to determine if more workers are needed

The Site-Link Network Connection

The Site-Link Manager Software manages the initial setup of the computer system that manages the Site-Link 3D communications network.

1. Press **Setup ▸ Site-Link ▸ Network Connection (**Figure 2-60**)**.

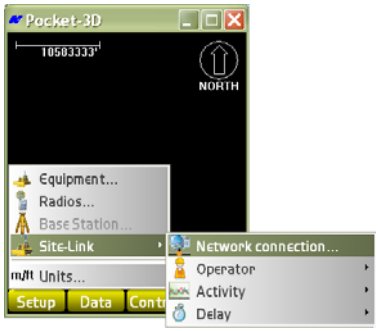


Figure 2-60. Network Connection

2. On the ***Site-Link Connection*** dialog box (Figure 2-61 on page 2-46), set the following parameters:
   - Server name/port – Select a port ID address from the drop-down menu or press the
   - SiteID – display-only field that shows the name of the site.
     – : press to display alphanumeric keyboard to enter server address.
   - Timeout (secs) – enter a time-out value.
   - MachineID – enter a machine description.
   - Status – shows if status is connected/disconnected to server.
   - **Ok** – press to accept selections and return to the Main Screen.
   - **Cancel** – press to quit without saving changes and return to the Main Screen.

Figure 2-61. The Site-Link Connection

Once you return to the main screen, the Site-link icon turns Green when connected. If Site-link is not connected, the ***Sitelink*** icon turns Red.

Connecting to SiteLink-3D

To connect to Site-Link, upon Pocket-3D startup, enter the Site-Link 3D password.

Contact your Topcon dealer for the password.

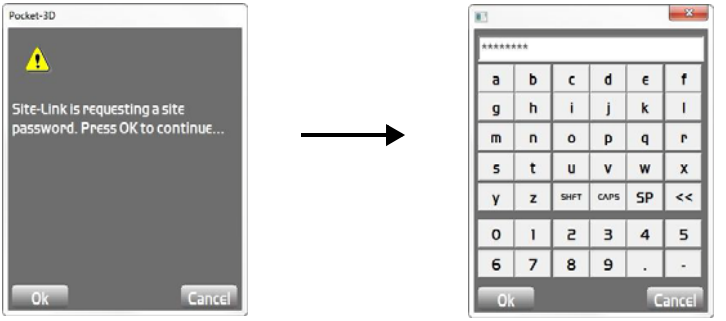

Pocket-3D
Site-Link is requesting a site password. Press OK to continue...
Ok
Cancel
****
a b c d e f
g h i j k l
m n o p q r
s t u v w x
y z SHIFT CAPS SP <<
0 1 2 3 4 5
6 7 8 9 . -
Ok
Cancel

Figure 2-62. Start-up Screen

To download a project file, see “Exporting a Project File Via Site-Link” on page 2-51 for more information.

NOTICE

You must have an active project enabled to connect to Site-Link 3D.

Selecting the Current Operator

Press **Setup** ▸ **Site-Link** ▸ **Operator** (see “Add, Edit, or Remove Registered Machine Operators” on page 2-47) to select an operator to add, edit, and remove registered machine operators. This same list of operators will be seen each time the machine operator using 3DMC connects to Site-Link.

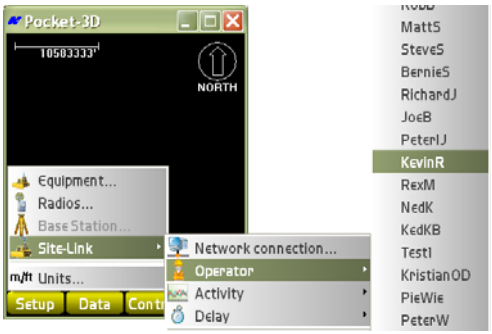


Figure 2-63. Add, Edit, or Remove Registered Machine Operators

NOTE

It is important that all new operators get added to Site-Link Manager as soon as possible so that data reports will not indicate invalid or null operator associations.

Managing Activities/Delays

Press **Setup** ▸ **Site-Link** ▸ **Activity/Delay** (administrator only) to add, edit, or remove registered machine activities and delays (“Monitor Machine Activities/Delays” on page 2-48). Only then can the Pocket-3D machine operator select an appropriate activity or delay from the same list given to him/her on the machine. From this

list you can also see what specific task a machine is currently performing, which becomes helpful in creating database reports later on.

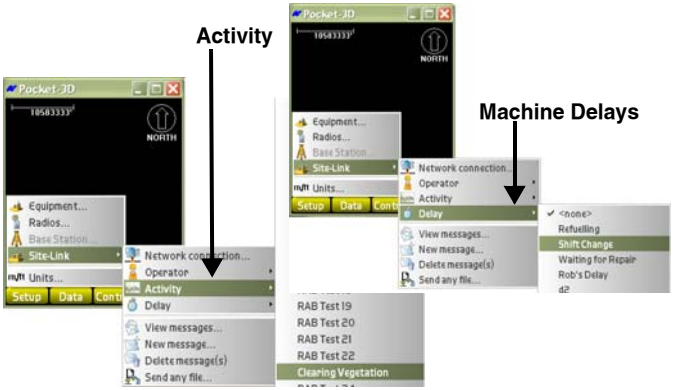


Figure 2-64. Monitor Machine Activities/Delays

Sending, Viewing, and Deleting Messages

With Site-Link, you can send and receive messages from the machine operator at the jobsite. Do the following to send a message:

1. Press **Setup ▸ Site-Link ▸ New message** to send a message to the machine operator at the jobsite or click on the new message icon on the main screen to view the unread message; just click **Reply** to respond to the message.

   NOTE: When the new message icon is Yellow, there is an unread message
2. On the ***messages To:***screen (Figure 2-65 on page 2-49), use either the pop-up keyboard and the mouse or the computer keyboard, to enter a new message.
3. Press **Ok** to return to the Main Screen.

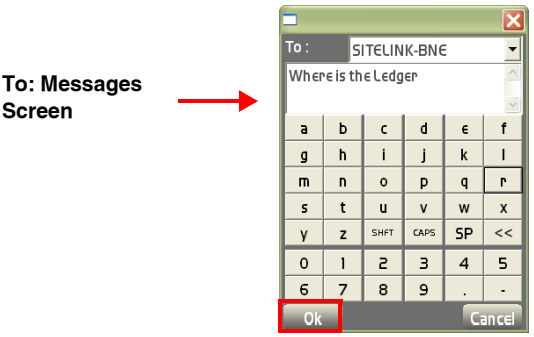


Figure 2-65. Enter a Message for the Machine Operator

To view a new message, do the following:

1. Press **Setup** ▸ **Site-Link** ▸ **View message(s)**.
2. On the ***view messages*** dialog box (Figure 2-66), press **Reply** to answer the message shown on the screen.

   The screen shows the day and time the message was sent.
3. Press **Ok** to send the message.
4. Press **Cancel** to return to the Main Screen.

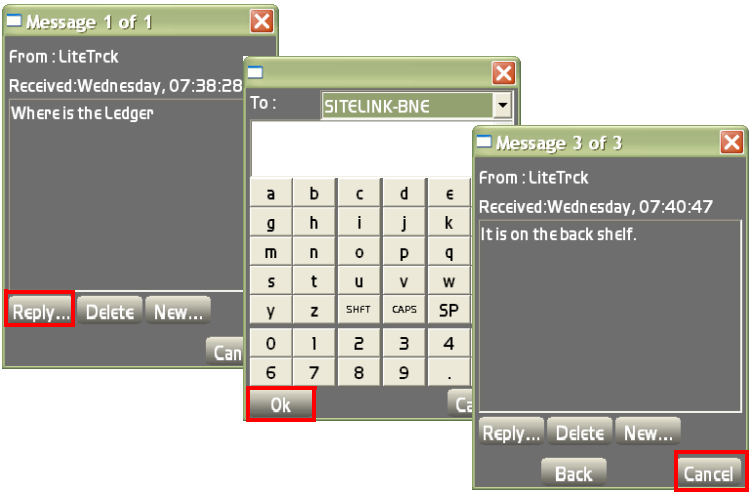


Figure 2-66. Send and Receive Messages

When a new message arrives in Pocket-3D, you will hear a “Ding-Dong” sound on the main screen.

To delete a message, do the following:

1. Press **Setup ▸ Site-Link ▸ Delete message(s) (**Figure 2-67).
2. Press **Ok** to delete all messages and return to the Main Screen (Figure 2-67).

Figure 2-67. Delete Messages

Send Any File to the Jobsite

If there is a file the machine operator needs, it is possible to send a file to the operator without delay.

1. Press **Setup ▸ Site-Link ▸ Send any file (**Figure 2-68 on page 2-51**).**
2. On the ***Open*** dialog box, highlight a file to select it and press **Open**.
3. On the ***Send*** dialog box, highlight a file to send in to ***To*** field.

   In the To field, you can select the machine, office computer, or any other survey crew to send the file(s) to.
4. Press control-Shift to send to multiple people. You can even send the file to people off-line if the ***Show offline clients*** box is

marked (Figure 2-70 on page 2-52). Any type of file can be sent.

5. Press **Ok** to send the file to the machine operator on the jobsite.

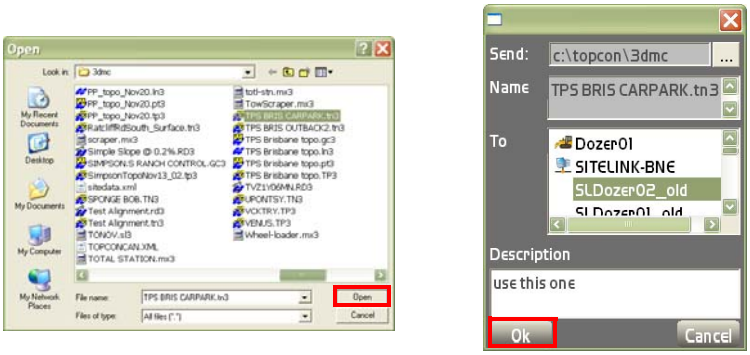


Figure 2-68. Send Any File

Exporting a Project File Via Site-Link

1. Press **Data ▸ Project ▸ Import/Export ▸ Via Site-Link (**Figure 2-69).

Figure 2-69. Select Project File Via Site-Link

The ***Pocket-3D confirmation*** dialog box displays (Figure 2-70 on page 2-52).

2. If you press Yes on the ***Pocket-3D confirmation*** dialog box, do the following:
   - On the ***import/export To:*** dialog box, highlight to select the desired project file for import/export (Figure 2-70 on page 2-52).

- Check mark the ***Show offline clients*** box to display both online and offline clients and enter a description if you prefer (optional), then press **Next**.

3. On the ***project selection*** dialog box, check mark the ***Set as Current active project*** box only if you want to overwrite the other client's current project(Figure 2-70).

   If this the box is unchecked, the file goes to the clients "in box" where he can later retrieve the file by pressing **Copy ▸ From Inbox**.

4. On the ***project selection*** dialog box, check mark the ***Overwrite project w/same name*** box if the project name is the same as one that already exist (Figure 2-70), then press **Next**.

5. Press **Finish** to save and return to the Main Screen.

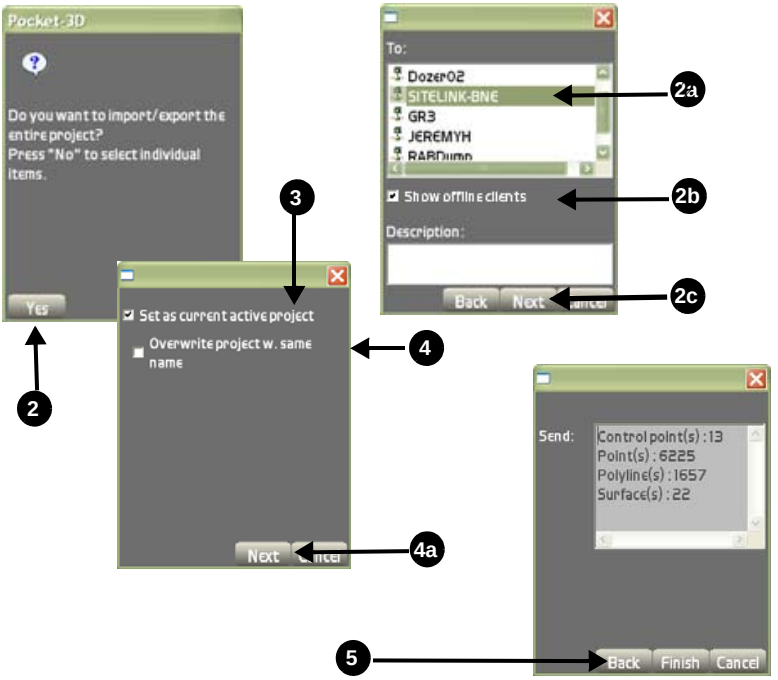


Figure 2-70. Import-Export Control Data

6. If you press **No** on the ***Pocket-3D confirmation*** dialog box, do the following to select individual items:

- On the Pocket-3D confirmation dialog box, press **No**.
- On the ***Surface(s)*** dialog box, highlight a file to select it, then press **Next** (Figure 2-72 on page 2-53).

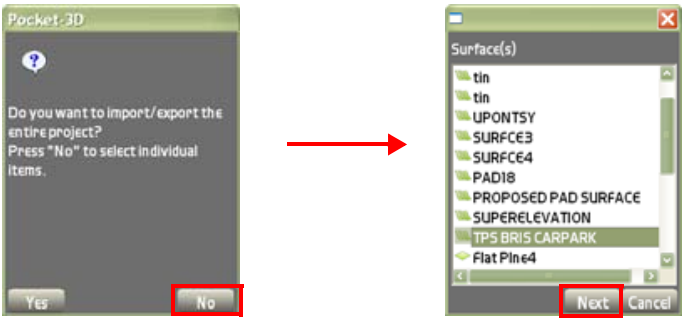


Figure 2-71.

7. On the ***Linework(s)***, ***Point(s)***, and ***Control Data*** dialog boxes, check and enable the desired selection after pressing **Next (**Figure 2-72**)**.

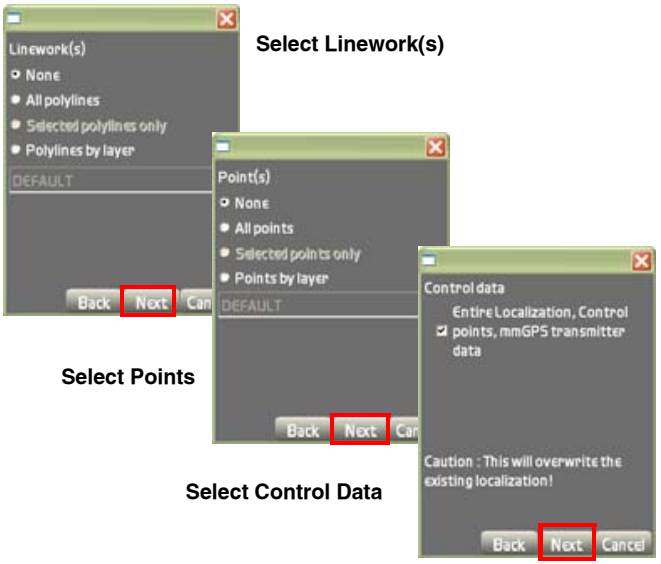


Figure 2-72. Linework, Point, and Control Data Dialog Boxes

8. After pressing Next on the ***Control data*** dialog box, the ***import data*** dialog box displays (Figure 2-73 on page 2-54).

9. Press **Next** to display the ***Send*** dialog box (Figure 2-73).
10. On the ***Send*** dialog box (Figure 2-73), press **Finish** to save changes and return to the Main Screen.

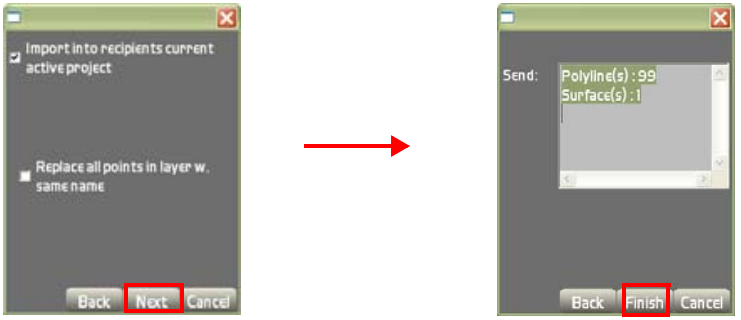


Figure 2-73. Importing/Exporting Control Data

Importing/Exporting Control Points Via Site-Link

To add, edit, delete, or import/export a control point via Site-Link, do the following:

1. Press **Data ▸ Control ▸ Import/Export ▸ Via Site-Link** (Figure 2-74).

Figure 2-74. Import/Export Control Points

2. On the ***Control data*** dialog box (Figure 2-75 on page 2-55), check mark the box to import the entire localization, control points, and mmGPS transmitter data into the project file.

3. Press **Next** to display the ***Control Points To:*** dialog box (Figure 2-75).

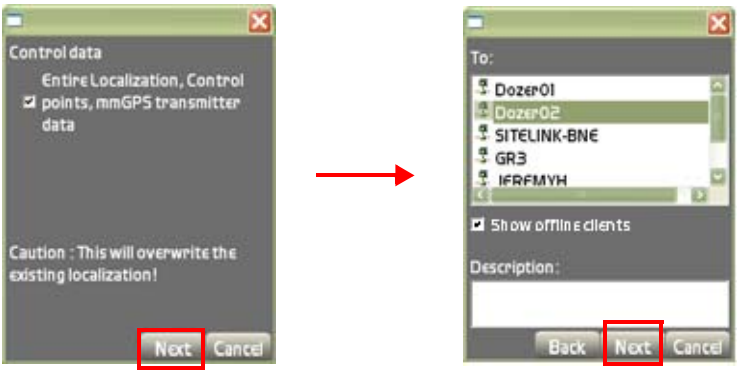


Figure 2-75. Control Data Dialog Box for Control Points

4. On the ***Control Points To:*** dialog box, do the following:
   - ***To:*** field – highlight the selected client(s) to send localization/ control points. To send to multiple clients, "tab and hold" the stylus on the screen.

     Active clients will be at the top of the list with a green icon.
   - ***Show offline clients*** – check mark this box to view clients offline, as well as those online. Uncheck to show only those online.

     Offline clients will be at the bottom of the list with a red icon.
   - ***Description*** field – enter a brief description of the file (optional)
   - **Back –** press to return to Control data dialog box (Figure 2-76 on page 2-56).
   - **Next – press** to display the confirmation dialog box (Figure 2-76 on page 2-56).
   - **Cancel –** press to quit and return to the Main Menu (Figure 2-76 on page 2-56).
5. On the ***confirmation*** screen (Figure 2-76 on page 2-56), do the following:
   - Check mark the ***Import into recipients current active project*** box to import the control points into an active project.

- Press **Back** to return to the previous screen.
- Press **Next** o display the ***Send*** dialog box (Figure 2-76).
- Press **Cancel** to quit and return to the Main Menu.

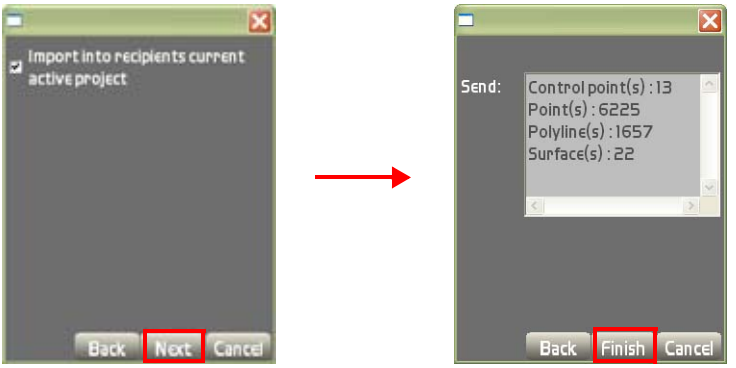


Figure 2-76. Import Control Points Via Site-Link

6. On the ***Send:*** dialog box, do the following:
   - Press Back to return to the previous menu.
   - Press **Finish** to save the file.
   - Press **Cancel** to quit and return to the Main Menu.

Importing/Exporting Surface Files Via Site-Link

To Import/Export surface files via Site-Link, do the following.

1. Press **Data** ▸ **Surface** ▸ **Import/Export** ▸ **Via Site-Link** (Figure 2-77).

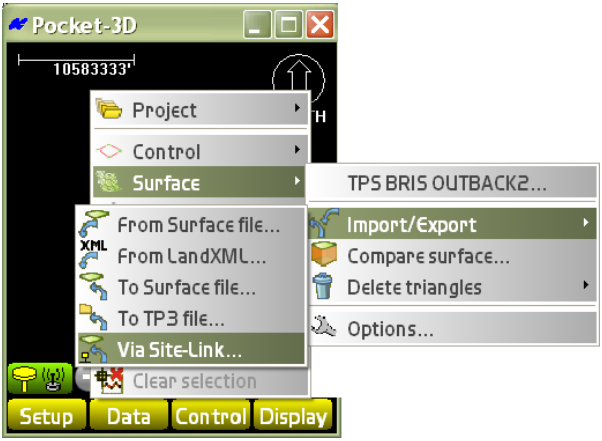


Figure 2-77. Import a Surface File Via Site-Link

2. On the ***Surface(s)*** dialog box, highlight to select surface file(s) and press **Next** (Figure 2-78 on page 2-58).
3. On the ***export surfaces To:*** dialog box, highlight to select a file and press Next (Figure 2-78 on page 2-58).

Figure 2-78. Select a Surface File to Import

4. On the ***import surface files*** dialog box (Figure 2-79 on page 2-59), do the following:
   - Import into recipients current active project – enable to import surface files into the current project.
   - Overwrite surface w.same name – enable to keep name of previous file.
   - Replace all lines in layer w.same name – enable to replace all lines in layer with the same name.
   - **Back** – press to go back to previous screen.
   - **Next** – press to go to the ***Send*** dialog box (Figure 2-79 on page 2-59).
   - **Cancel** – press to quit and return to the Main Screen.
5. On the ***Send*** dialog box (Figure 2-79 on page 2-59), press **Finish** to send the file and return to the Main Screen.

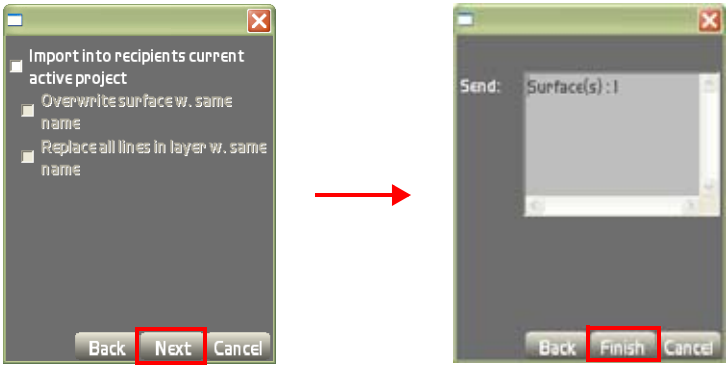


Figure 2-79. Import Surface Files Via Site-Link

Importing/Exporting Alignment Files Via Site-Link

To export-import alignment files via Site-Link, do the following:

1. Press **Data** ▸ **Alignment** ▸ **Import/Export** ▸ **Via Site-Link** (Figure 2-80).

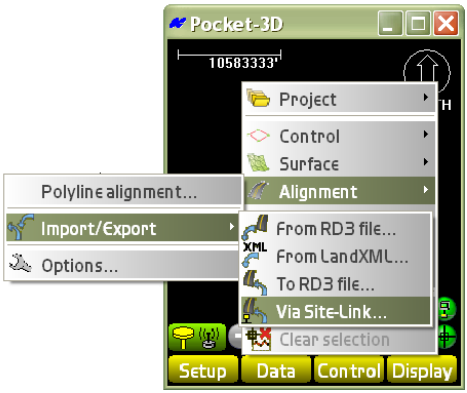


Figure 2-80. Export-Import Alignment Files Via Site-Link

2. On the ***Surfaces*** dialog box (Figure 2-81), highlight to select a specific surface file for the alignment, then press **Next** to display the ***import alignment files To:*** dialog box (Figure 2-81).

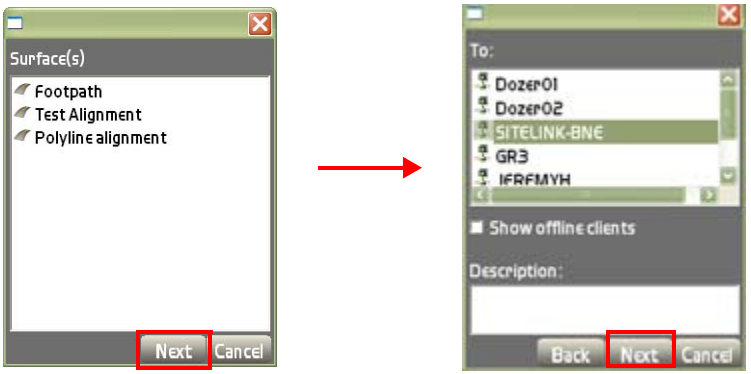


Figure 2-81. Import Alignment Files

3. On the ***import alignment*** files ***To:*** dialog box, highlight a file to select it and press **Next** (Figure 2-81).
4. On the ***import alignment file*** dialog box (Figure 2-82), do the following:
   - Import into recipients current active project – check mark this box to import surface files into your project.
   - Overwrite surface w.same name – check mark this box to overwrite duplicate filenames.
   - **Next** – press to display the ***Send*** dialog box (Figure 2-82).

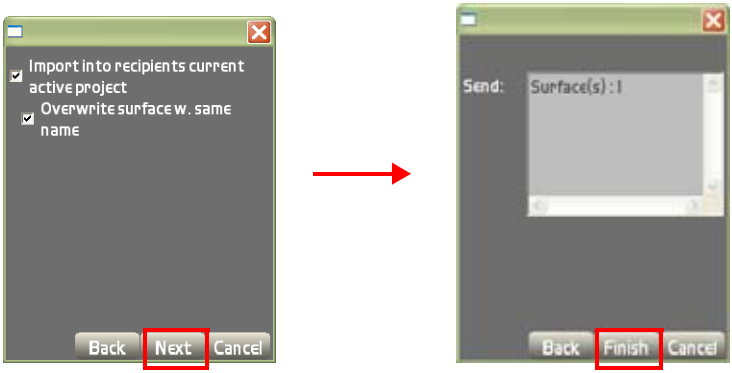


Figure 2-82. Import an Alignment File

- On the ***Send*** dialog box, press **Finish** to save and return to the Main Screen (Figure 2-82 on page 2-60).

Importing/Exporting Linework Files Via Site-Link

To Import/Export surface files via Site-Link, do the following:

1. Press **Data ▸ Linework ▸ Import/Export ▸ Via Site-Link (**Figure 2-83 on page 2-61).

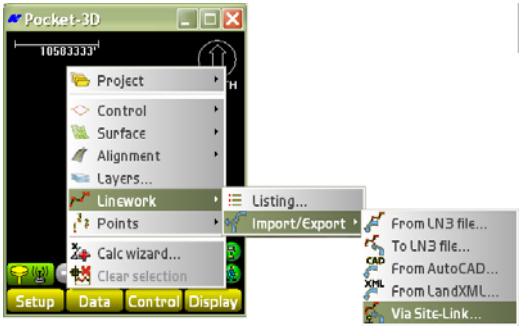


Figure 2-83. Import/Export Linework Files

2. On the ***Linework(s)*** dialog box, select ***None***, ***All Polylines***, ***Selected Polylines only*** or select a layer from the ***Polylines by layer*** drop-down list to import (Figure 2-84 on page 2-62).
3. Press **Next** to continue.
4. On the ***import linework To:*** dialog box (Figure 2-84 on page 2-62), highlight a file to select it and press **Next**.

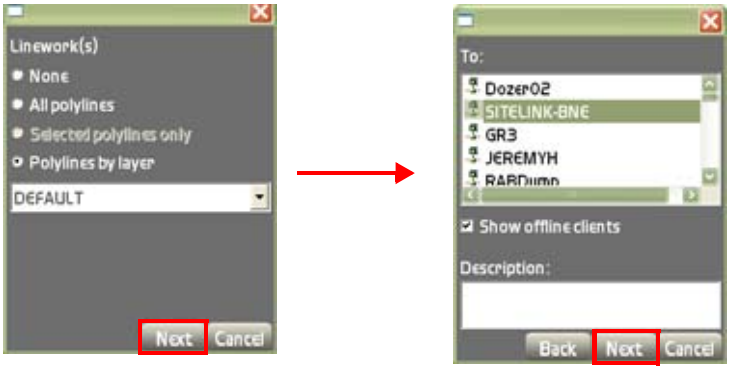


Figure 2-84. Importing Linework Files Via Site-Link

5. On the ***lineworks file*** dialog box (Figure 2-85), do the following
   - Import into recipients current active project – check mark this box to import surface files into your project.
   - Overwrite surface w.same name – check mark this box to overwrite duplicate filenames.
   - **Next** – press to display the ***Send*** dialog box (Figure 2-85).

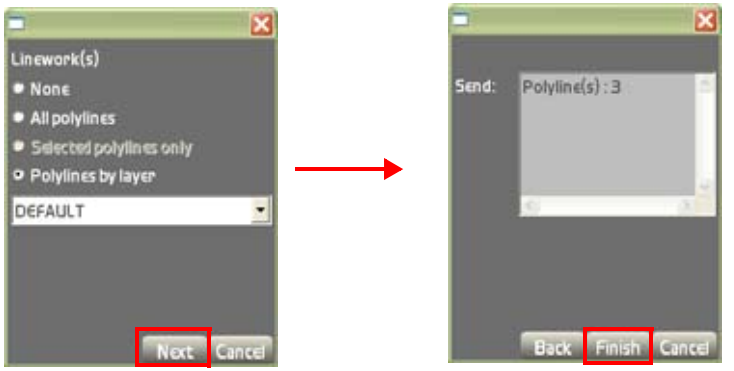


Figure 2-85. Import Alignment File into Current Project

6. On the ***Send*** dialog box, press **Finish** to save and return to the Main Screen (Figure 2-85).

Importing/Exporting Points Via Site-Link

To Import/Export point files via Site-Link, do the following:

1. Press **Data** ▸ **Points** ▸ **Import/Export** ▸ **Via Site-Link** (Figure 2-86).

Figure 2-86. Import/Export Point Files Via Site-Link

2. On the ***Points*** dialog box, select ***None***, ***All Polylines***, ***Selected Polylines only*** or select a layer from the ***Polylines by layer*** drop-down list to import.
3. Press **Next** to continue.
4. On the ***Points To:*** dialog box (Figure 2-87 on page 2-64), highlight a file to select it and press **Next**.

Figure 2-87. Select Points for Export-Import

5. On the ***points file*** dialog box (Figure 2-88), do the following
   - Import into recipients current active project – check mark this box to import surface files into your project.
   - Replace all points in layer w.same name – check mark this box to overwrite duplicate filenames.
   - Press **Next** to display the ***Send*** dialog box (Figure 2-88).

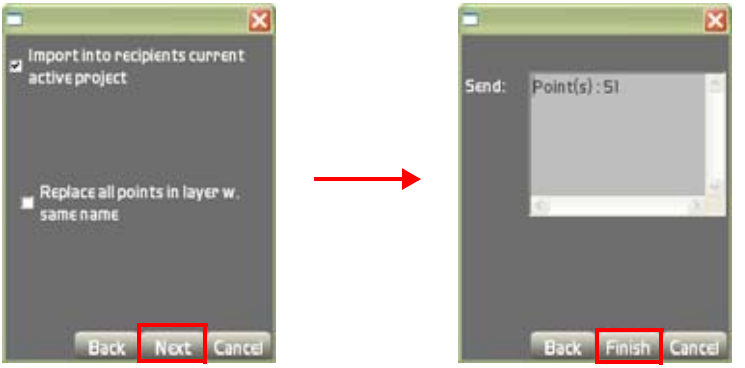


Figure 2-88. Import Points Into Project

6. On the ***Send*** dialog box, press **Finish** to save and return to the Main Screen (Figure 2-88).

Data Menu

The Data menu (Figure 3-1) has the following menu items:

- Project
- Control
- Surface
- Alignment
- Layers
- Linework
- Points
- Calculation type
- Clear Selection

Figure 3-1. Data Menu Options

Project

In GPS control applications, the project engineer provides a design surface file for the jobsite. The correct file must be copied into the GX-60 control box and selected as the project for the jobsite.
To access available Project files or to create a new Project file, tap **Data Menu ▸ Project ▸ <none> (**Figure 3-2**)**.

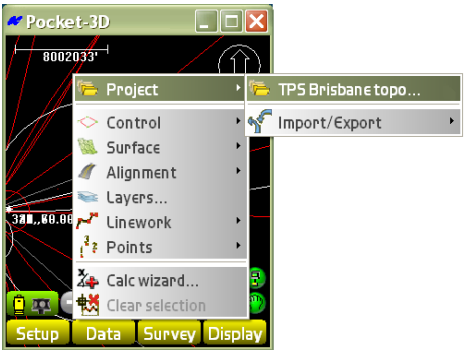


Figure 3-2. Data Project Menu [File

To change the Project file, highlight a file from the list and press **Ok** (Figure 3-3 on page 3-2). At the verification screen, press **Yes** to use this Project file for the current project. Project files can be created, copies, or deleted. GPS localization files can also be viewed and saved.

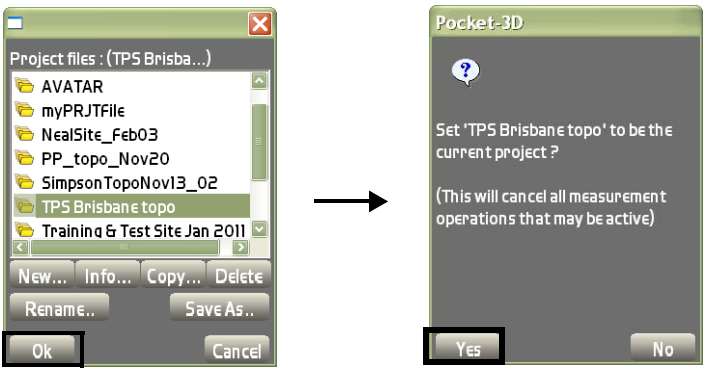


Figure 3-3. Copy a Project File

- **New** – create a new file by entering a filename. After naming the file, press **Ok** to save the information (Figure 3-4).

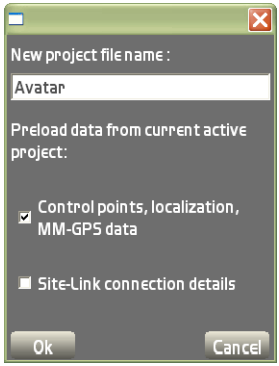


Figure 3-4. New Project File

- **Info** – displays the information on the selected file (Figure 3-5 on page 3-3). Press **Save** to save the information as a text file on the ***Save as*** dialog box or **Cancel** to return to the previous screen. Enter the name of the new file and press **Ok**.

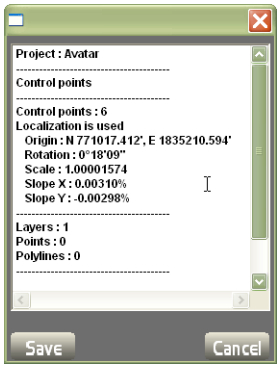


Figure 3-5. Project File Information

- **Copy** – copies a file either from internal memory, Network or CF (Compact Flash) Card, to the Network or CF card. The touch screen lists all file available for copying. Select a file to copy, then press **Ok**. At the verification screen, press **Ok** again.

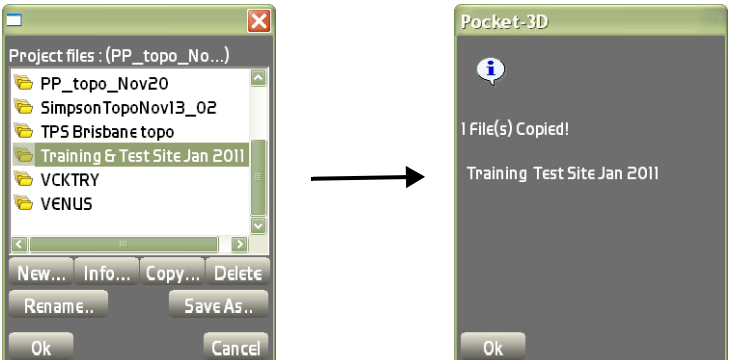


Figure 3-6. Copy Project Files

- **Delete** – removes an existing file from internal memory. Select a file to remove, then press **Delete**.

  The program always reminds the operator to confirm deletion of a selected file. Select **Yes** to confirm the deletion.

- **Rename** – opens the New project file name dialog box (Figure 3-4 on page 3-3) to change the name of the selected file.

- **Save As** – opens the New project file name dialog box (Figure 3-4 on page 3-3) to save the selected file under a new name.

Import/Export

To import a project file, click **Topcon Logo ▸ Data ▸ Project ▸ Import/Export ▸ From TP3 file** on the Main Screen (Figure 3-7 on page 3-5).

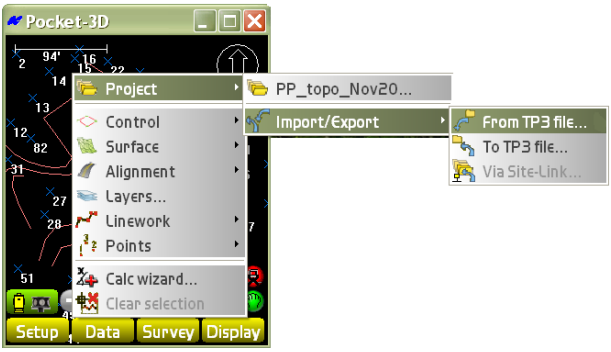


Figure 3-7. Select a Design Surface File

1. On the ***File*** dialog box, select a project (***.TP3***) file to import. Then click **Open**. The ***Copy files*** dialog box displays (Figure 3-8).

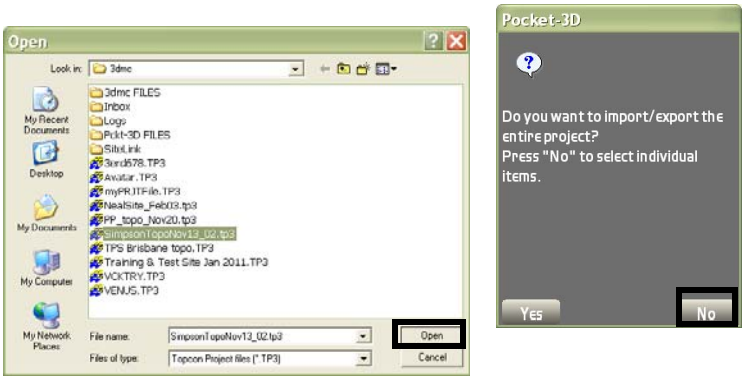


Figure 3-8. Import a Project File

2. At the prompt, press **Yes** to Import/Export the entire project or press **No** to select individual items.

3. On the ***Surface(s)*** dialog box (Figure 3-9), select the surface to import from the list. Then press **Next**.

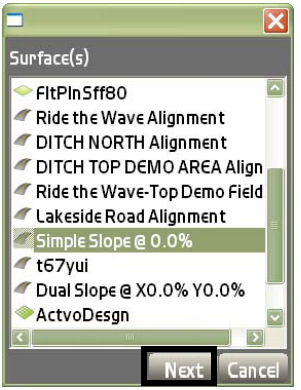


Figure 3-9. Select a Surface File to Import

4. On the ***Linework(s)*** dialog box (Figure 3-10), select one of the following, then press **Next**:
   - None – enable to display no polylines.
   - All polylines – enable to display all polylines in the project.
   - Selected polylines only – available only if polylines are highlighted (selected) on the main screen.
   - Polylines by layer – enable to select a layer to import from the drop-down list.

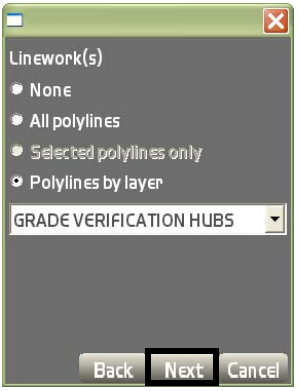


Figure 3-10. Select Lineworks for the Project

5. On the ***Point(s)*** dialog box (Figure 3-11), do the following to import points, then press **Next**:
   - None – enable to display no points.
   - All points – enable to display all points in the project.
   - Selected points only – available only if points are highlighted (selected) on the main screen.
   - Points by layer – enable to select a layer to import from the drop-down list.

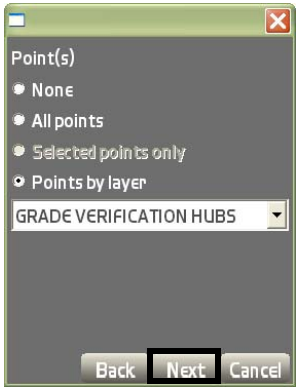


Figure 3-11. Select Points to Import for the Project

6. On the ***Control data*** dialog boxes (Figure 3-12 on page 3-8), do the following to import control point data, then press **Next**:
   - Entire Localization, Control points, mmGPS transmitter data – check mark this box to import localization data, to import control points, or to import MMGPS transmitter data, when available.
   - Overwrite surface w.same name – check mark this box to avoid duplicate surface file names.
   - Replace all points in layer w.same name – check mark this box to avoid duplicate point names.

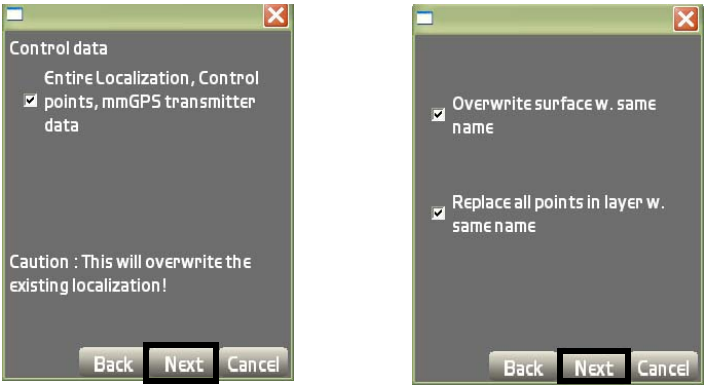


Figure 3-12. Control Data for the Design Surface

7. On the ***Import*** dialog box (Figure 3-13), press **Finish** to save and display the results on the main screen or press **Back** to edit your selections.

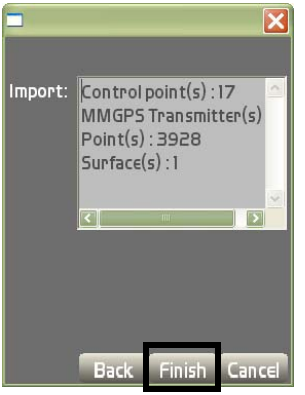


Figure 3-13. Import Control Point(s), Polylines, and Surface Files

Export TP3 Files To export surface files, linework, and control points to a project file, tap **Topcon Logo ▸ Data ▸ Project ▸ Import/ Export ▸ To TP3 file (**Figure 3-14 on page 3-9).

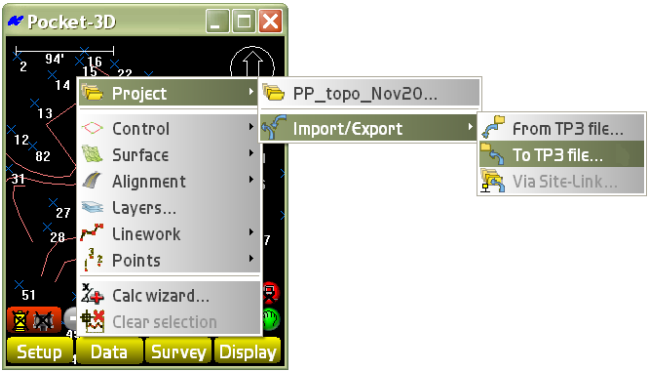


Figure 3-14. Export a Project File

1. On the **verification screen** (Figure 3-15), do the following to export a *.**TP3*** file:
   - Press **Yes** to export the entire project file. The ***Export/To*** dialog box displays (Figure 3-15).
     – From the **To** field, press the **browse** button (...) to select the destination to export the project file to.
     – Enter a name for the export file.
   - Press **Finish** to save and display the results on the main screen.

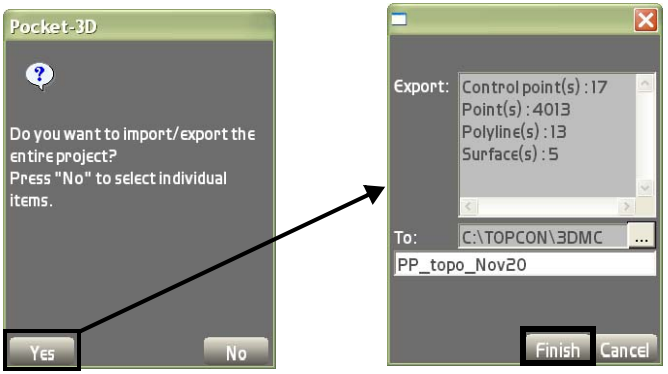


Figure 3-15. Export Control Point(s), Polylines, and Surface Files

- Press **No** to open the ***Surface(s)*** dialog box (Figure 3-16) to select the surface(s) to export, then press **Next**.

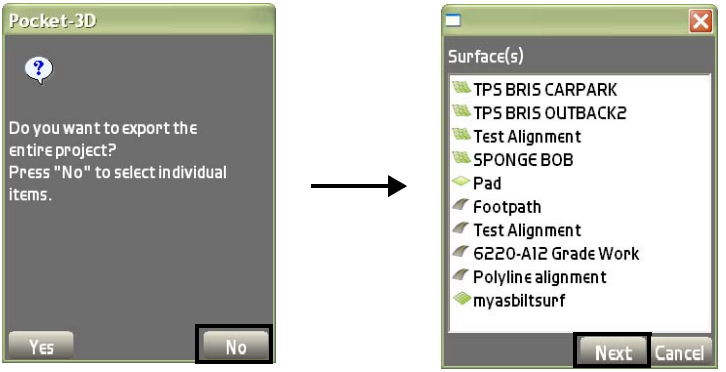


Figure 3-16. Export a Surface

2. On the ***Linework(s)*** dialog box (Figure 3-17), select one of the following, then press **Next**:
   - None – enable to display no polylines.
   - All polylines – enable to display all polylines in the project.
   - Selected polylines only – available only if polylines are highlighted (selected) on the main screen.
   - Polylines by layer – enable to select a layer to import from the drop-down list.

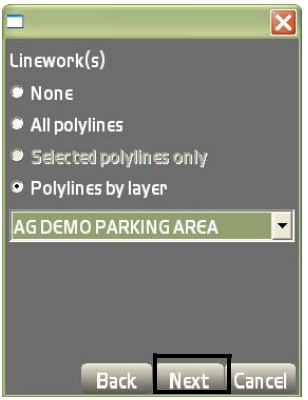


Figure 3-17. Select Linework(s) to Export for the Project

3. On the ***Point(s)*** dialog box (Figure 3-18), do the following to import points, then press **Next**:
   - None – enable to display no points.
   - All points – enable to display all points in the project.
   - Selected points only – available only if points are highlighted (selected) on the main screen.
   - Points by layer – enable to select a layer to import from the drop-down list

Figure 3-18. Select Points to Export for the Project

4. On the ***Control data*** dialog box (Figure 3-19 on page 3-12), do the following to export control point data, then press **Next**:
   - Control point(s) – check mark this box to export control points.
   - Localization – check mark this box to export localization data.
   - MMGPS Transmitter(s) – check mark this box, when available, to export MMGPS transmitter data.

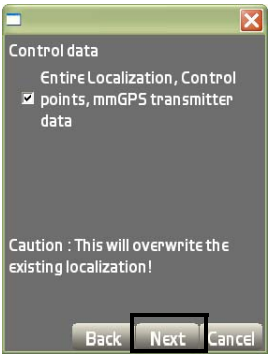


Figure 3-19. Control Data for the Design Surface

5. On the ***Export/To*** dialog box (Figure 3-20 on page 3-12), do the following:
   - Select the (To...) option to determine the export destination (Figure 3-20).
   - Enter a name for the exported file.
   - Press **Finish** to save.

Figure 3-20. Export/To Project File Dialog Box

Control

Used in both 3D GPS+, Total Station, and Robotic applications, the Control menu creates, edits, and deletes Control Point files. Control Point files can also be copied between the Pocket-3D controller and the Control Box using a Flash Card.

Control Point files store ground coordinates and WGS84 values for each point. These values are required to position the Design Surface in the proper location. When beginning a job, the project's survey team locates and measures jobsite control points, called localization. When beginning a job, obtain a list of all control points in and around the jobsite.

Before beginning any 3D project, the operator must obtain or create a new Control Point file. Once stored in the internal memory, select the correct file before starting localization.

Control Points

To add, edit, delete, or import a control point into the selected Control Point file, tap **Data ▸ Control ▸ Control points** (Figure 3-21).

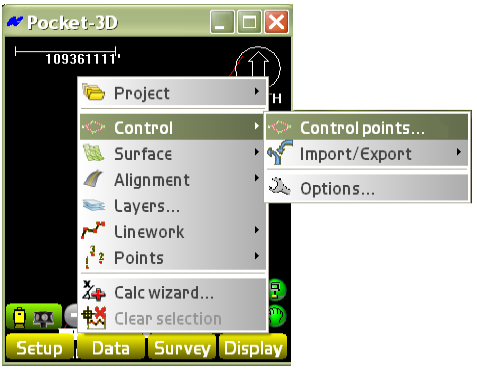


Figure 3-21. Data ▸ Control ▸ Control Points

The ***control points*** dialog box displays all points within the selected file (Figure 3-22 on page 3-14).

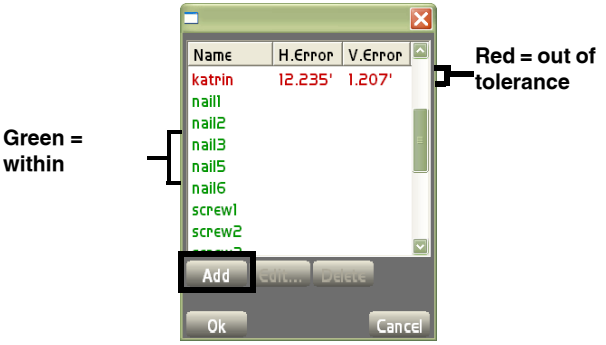


Figure 3-22. Control Points Dialog Box

Add Control Point On the ***control points*** dialog box, press **Add** to enter a control point and its respective information (Figure 3-23). After entering the control point's information, press **Ok** to save the information.

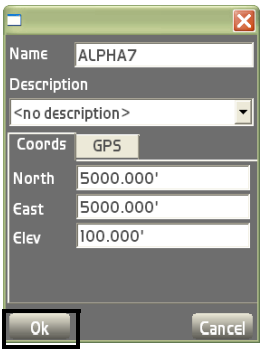


Figure 3-23. Add Control Point

- Name – enter in the name of the control point.
- Description – enter in a description (if desired) for the control point.
- Coords tab – displays the Northing, Easting, and Elevation for the control point (Figure 3-23).
  - Tap in each ***coordinate*** entry box to enter the coordinates for ***Northing*** (North), ***Easting*** (East), and Elev (***Elevation***).

- GPS tab – displays the Latitude, Longitude, and Height for the control point (Figure 3-24). Either manually enter the lat/long and height or obtain this information using the GPS+ receiver. Measuring each point is the standard practice for localization.
  - If you have precise ***GPS coordinates***, enter the coordinates for Latitude (Lat), Longitude (Lon), and Height (Hgt). Skip this step when measuring points for localization.
  - Use horizontal: used for the purpose of localization. Enable to use the control point as a horizontal control point.
  - Use Vertical: used for the purpose of localization. Enable to use the control point as a vertical control point.
  - Measure: used in localization to acquire precise GPS coordinates. Press **Measure** when ready to collect a point; the ***measurement*** dialog box opens and the Rover begins to measure the Control Point.

    After a successful measurement, measured GPS coordinates display in the ***Lat*** (latitude), ***Lon*** (longitude), and ***Hgt*** (height) entry boxes. Press **Ok** to save the measurements and return to the ***control points*** dialog box.

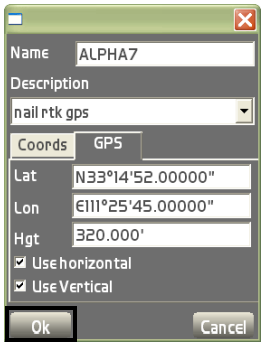


Figure 3-24. Add Control Points – GPS Tab

Edit Control Point On the ***control points*** dialog box, press **Edit** to edit the selected control point. See "Add Control Point" on page 3-14, Figure 3-23 on page 3-14 and Figure 3-24 above for details.

Delete Control Point On the ***control points*** dialog box (Figure 3-22 on page 3-14), press **Delete** to delete the selected control point.

The program always reminds the operator to confirm deletion of a selected file. Select **Yes** to confirm the deletion.

Import/Export

To import a control file, tap **Data ▸ Control ▸ Import/Export ▸ Points only** (Figure 3-25). Files can be imported from Topcon Project files (***TP3***), Control Point files (***GC3***), Topcon Point files (***PT3***), and Text files (***TXT***).

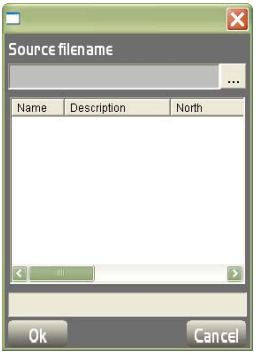


Figure 3-25. Data ▸ Control ▸ Import/Export ▸ From Text File

On the ***file explorer*** dialog box (Figure 3-26 on page 3-17), navigate to and select the control points to import and press **Ok**.

- Source filename – displays the location and name of the file from which to import control points. Press the **browse** (...) button to select a new/different control point file.
- Control point list – lists all point(s) in the selected file. Select the point(s) to import into the current file and press **Ok**.

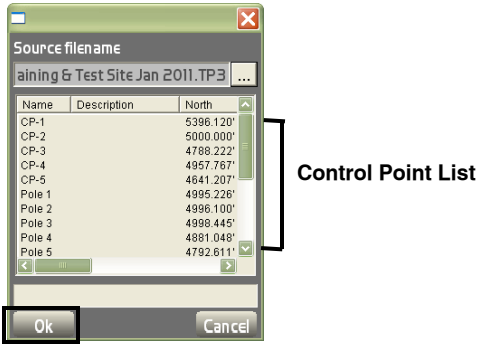


Figure 3-26. Import Control Points from the Explorer Dialog Box

From Text File

This menu option imports a text file as a control point file. Click **Data ▸ Control ▸ Import/Export ▸ Points only ▸ From text file**.

On the ***import from text file*** dialog box (Figure 3-27), select the following options:

- Source text file – press the **Browse** (...) button to select the text file to import.
- (Conversion) Format – select the conversion format from the drop-down list (Figure 3-27) and "Conversion Formats" on page 3-18 for details on creating formats.
- To create, edit, or delete a conversion format, press **Format** on the ***import from text file*** dialog box (Figure 3-27).

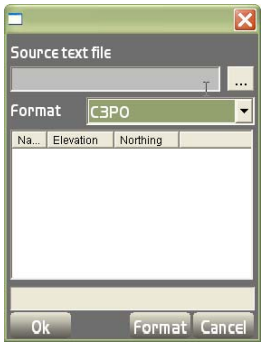


Figure 3-27. Import Points From a Text File

Conversion Formats

On the ***Conversion formats*** dialog box displays (Figure 3-28), do the following to create, edit, or delete a conversion format:

- **New** – on the ***conversion formats*** dialog box (Figure 3-28), press to enter a conversion format. The ***Format name*** dialog box displays (Figure 3-28).
  - Format name: enter the name of the conversion format.
  - Extension (***e.g.,TXT***): enter an extension type. Only enter generic ASCII formats; such as, ***.txt, .asc, .csv,*** etc.

Figure 3-28. Conversion Formats/Format Name Dialog Boxes

- **Edit** – on the ***Conversion formats*** dialog box, press **Edit** to change the selected format. See the "New" bullet above for details on the dialog box that displays.
- **Delete** – on the ***Conversion formats*** dialog box, press **Delete** to remove the selected format.

The Line Items tab on the ***Format name*** dialog box adds, edits, or deletes line items for the selected conversion format (Figure 3-30 on page 3-19).

- **Add** – on the ***Line items*** tab, press **Add** to add a line item and it's respective information (Figure 3-29 on page 3-19), then press **Ok** to save the information. Repeat this process for each line item.
  - Type: select either ***Point name***, ***Point description***, ***Point northing***, ***Point easting***, ***Point elevation***, ***Point layer name***,

Literal text string, ***Point WGS84 latitude***, ***Point WGS84 longitude***, or ***Point height***.

– Append: select either ***Trailing comma***, ***Trailing space***, ***Trailing tab***, or Northing.

– Fixed width field: enable to select a fixed width for each field.

– Justified: select ***Left***, ***Right***, or ***None***.

– Width: enter the desired value for field width.

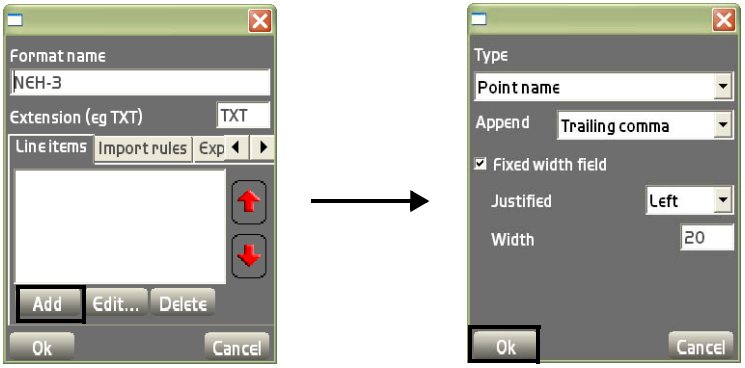


Figure 3-29. Enter Line Item Information

- **Edit** – on the ***Line items*** tab, press **Edit** to edit the selected line item. See the "Add" bullet on "page 3-18" and Figure 3-30 for details on editing the line item.
- **Delete** – on the ***Line items*** tab, press **Delete** to remove the selected line item. (Figure 3-30).

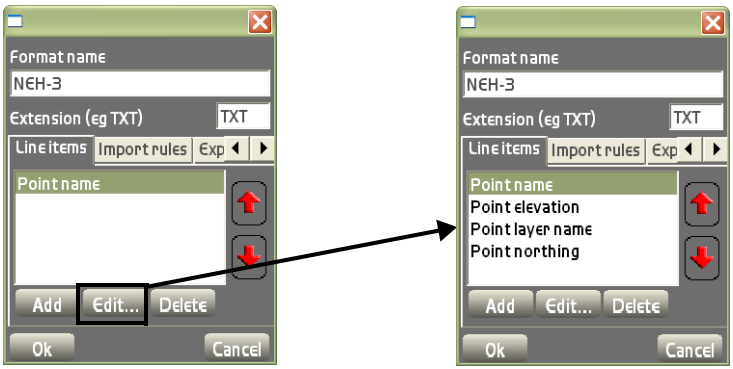


Figure 3-30. Line Items Tab

The Import Rules tab adds, edits, or deletes import rules for the selected conversion format (Figure 3-31).

- **Add** – on the ***Import rules*** tab, press **Add** to add an import rule and it's respective information (Figure 3-31 on page 3-20). After entering in all of the import rule's information press **Ok** to save the information.
  - Rule: select either ***Skip header lines*** or ***Skip prefixed lines***.
  - Number of lines: enter the desired number of header lines to skip during import.
  - Prefix: enter the prefix of the lines to skip during import.

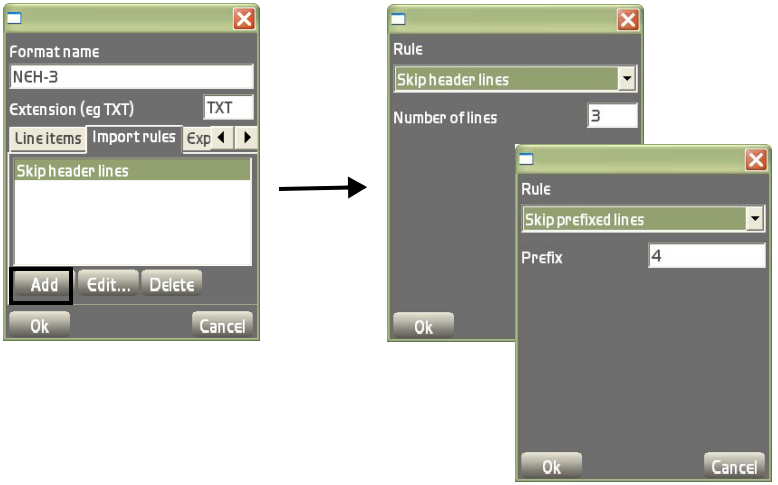


Figure 3-31. Add Import Rules

- **Edit** – on the ***Import rules*** tab, press **Edit** to edit the selected import rule. See the "Add" bullet above and Figure 3-31 for details on editing the import rule.
- **Delete** – on the ***Import rules*** tab, press **Delete** to remove the selected import rule (Figure 3-31).

The Export rules tab adds, edits, or deletes export rules for the selected conversion format (Figure 3-32 on page 3-21).

- **Add** – on the ***Export rules*** tab, press **Add** to add an export rule and it's respective information, then press **Ok** to save the

information (Figure 3-32).

– Rule: select Reassign null pt numbers.

– Assign pts with NO number starting at: enter the starting number to assign to the points with no point numbers.

Figure 3-32. Add Export Rule

- **Edit** – on the ***Export rules*** tab, press **Edit** to edit the selected export rule. See the "Add" bullet above and Figure 3-32 for details on editing the export rule.
- **Delete** – on the ***Export rules*** tab, press **Delete** to delete the selected export rule (Figure 3-32).

Control Point Options

The ***control options*** dialog box displays coordinate selection, projection location, and displays or hides control points, control point names and control point descriptions (Figure 3-33 on page 3-22). Click **Data ▸ Control ▸ Options** to display the ***control options*** dialog box.

The Coords tab on the ***control options*** dialog box displays (Figure 3-33) the type of coordinates system to use for jobsite control,

and selects the geoid model to use. Press **Ok** when done.

- Use localization – enable to use localization data.
- Use pre-defined projection – enable to use a pre-defined projection. Projection, datum, and elevation information will display.
- Use geoid model – enable to use a geoid model and select the geoid model from the drop-down list.

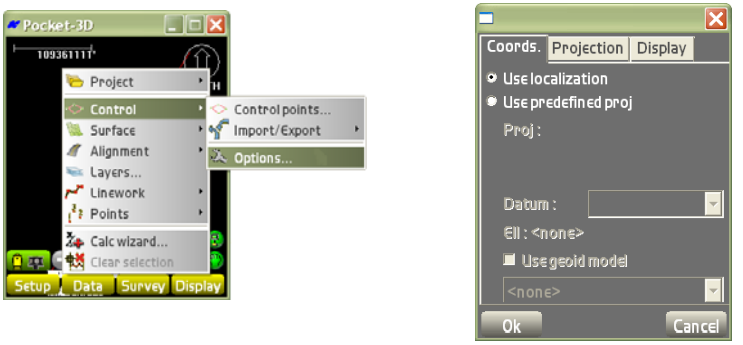


Figure 3-33. Control Point Options – Coords Tab

Support for non-Topcon Base Station An added datum option is now available to support the use of a non-Topcon base station (added support for NAD83_NO_trans). There is a difference between NAD83 and WGS84 parameters. Previously, when using a non-Topcon base station, a shift would appear. The only option was to use a localization when using a third-party base receiver. The new NAD83_NO_Trans accommodates for this shift by using a third-party base receiver.

1. To use this option, click **Data** ▸ **Control** ▸ **Options**.

   The ***option controls*** dialog box displays (Figure 3-34 on page 3-23).
2. On the ***Coords***. tab, enable the ***Use predefine proj*** option.
3. In the ***Datum*** drop-down field, select ***NAD83***.

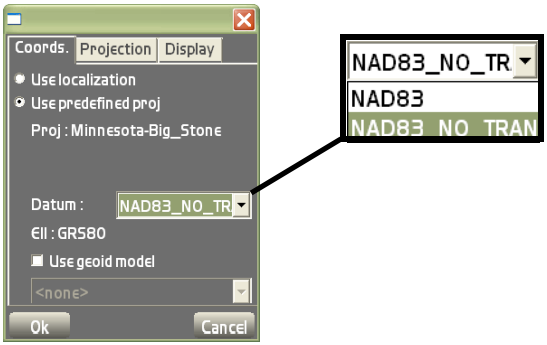


Figure 3-34. Support for non-Topcon Base Station

NOTE

To achieve accuracy when using the NAD83_NO_Trans, the correct ***.gff*** format geoid file must be used.

The Projection tab on the ***control options*** dialog box (Figure 3-35) displays a list of pre-defined projections to use for control. Select the projection for the area in which the jobsite is located.

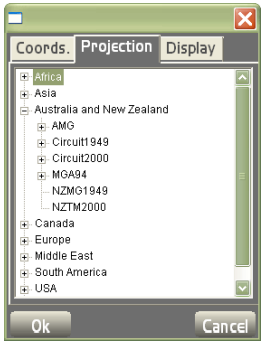


Figure 3-35. Control Options – Projection

The Display tab on the ***control options*** dialog box displays or hides control points, control point names, and control point descriptions (Figure 3-36 on page 3-24).

1. To use this option, click **Data ▸ Control ▸ Options.**
2. On the ***control options*** dialog box (Figure 3-36), press the ***Display*** tab and do the following and press **Ok**:

- Show control points – enable to display control point information on the main screen.
  - – Show names: enable to display control point names on the main screen.
  - – Show descriptions: enable to display control point descriptions on the main screen.
  - – Show points that are not part of localisation: enable to display points not part of the localization.

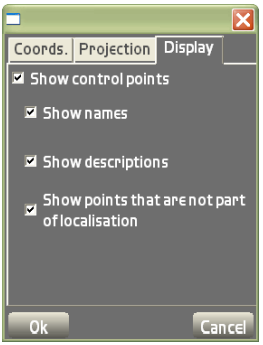


Figure 3-36. Control Options – Display Options

Surface

Used in 3D GPS+, Total Station, and Robotic applications, the Surface menu creates, edits, and selects Design Surface files. Design Surface files can also be copied between the Pocket-3D controller and the Control Box using a Flash Card.

Pocket-3D supports the following four types of Design Surface files:

- TIN Surface Model – large, irregularly shaped triangles. See "TIN Surface File" on page 3-26 for more details.

  A TIN surface represents a surface as a network of non-overlapping triangles. Within each triangle the surface is represented by a plane. The triangles are made from a set of points called mass points.
- Road Surface Model – horizontal alignments, vertical profiles, and templates situated (cross-section) along the road. See "Road

Surface File" on page 3-28 for more details.

- Plane Surface Model – defined with a continuous compound plane in two directions (mainfall and crossfall). See "Plane Surface File" on page 3-39 for more details.
- Best-fit Model – a dual-slope plane created to balance the cut/fill values across the entire area of interest. See "Best-fit Plane Surface File" on page 3-40 for more details.

Current File or <none>

Highlights the currently loaded Surface file or if no file has been selected, <none> is highlighted.

1. To access available Surface files, or to create a new Surface file, tap **Data ▸ Surface ▸ [current file]** (Figure 3-37).

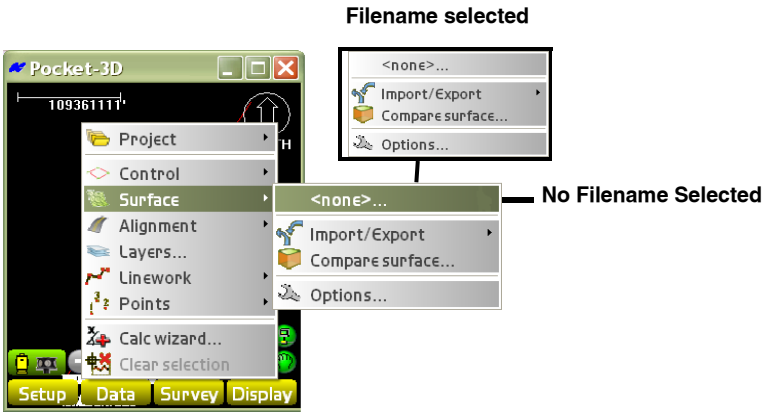


Figure 3-37. Data Surface None

2. The ***Surface(s)*** dialog box displays all surfaces available. To set a Surface file, select it from the list and press **Ok** (Figure 3-38 on page 3-26). At the verification screen, press **Ok** to use this Surface file as the current design surface. Surface Files can be created, exported, imported, or deleted.

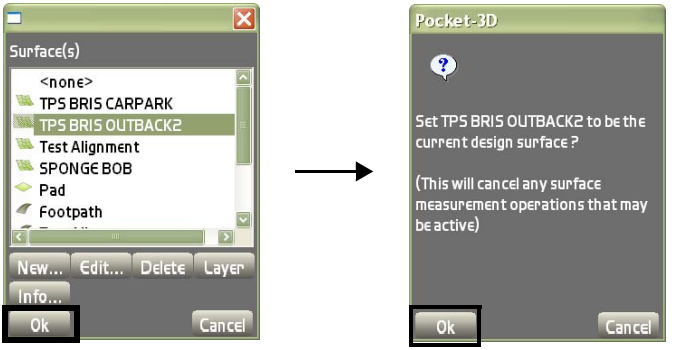


Figure 3-38. Surfaces Dialog Box

- **New** – displays the ***Surface type*** dialog box (Figure 3-39). Select one of the four types of Design Surface files: TIN, Road, Plane surface, or Best-fit plane surface.

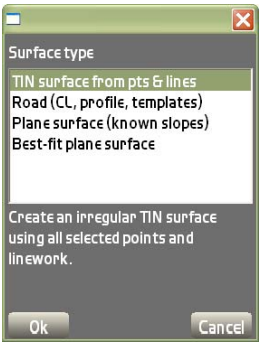

Surface type
TIN surface from pts & lines
Road (CL, profile, templates)
Plane surface (known slopes)
Best-fit plane surface
Create an irregular TIN surface using all selected points and linework.
Ok
Cancel

Figure 3-39. Surface Type Dialog Box

TIN Surface File

Creates an irregular TIN surface using selected points and linework. To configure a new TIN surface file, press **New** on the ***Surface(s)*** dialog box. Highlight the ***TIN surface from pts & lines*** on the ***Surface type*** dialog box, and press **Ok** (Figure 3-39).

The preview dialog box displays the TIN surface created from the selected points and/or lines (Figure 3-40). Press the +/- buttons to zoom in or out on the image, or press down on the screen and drag the image around. Press **Next** to continue.

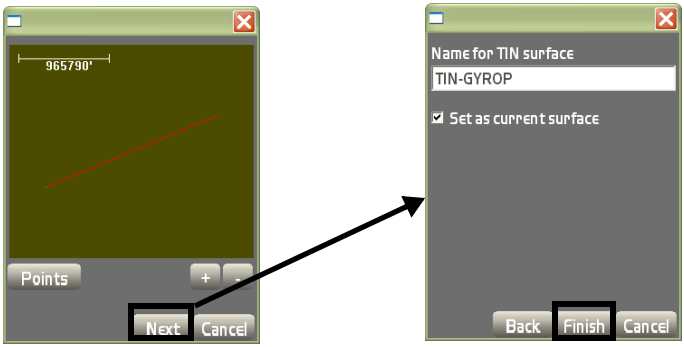


Figure 3-40. TIN Surface Preview

The TIN surface parameters dialog box sets the following parameters. Press **Finish** (Figure 3-40) to display the ***Surface(s)*** dialog box (Figure 3-41 on page 3-28).

- Name for TIN surface – enter the name of the TIN surface.
- Set as current surface – enable to set the surface as the current surface.
- **Ok** – press to display the ***new TIN surface confirmation screen*** (Figure 3-41 on page 3-28).

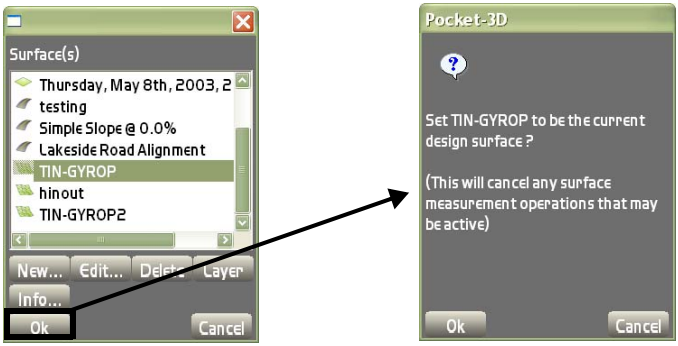


Figure 3-41. TIN Surface Parameters

- **Ok** – press to set the new surface as the current surface (Figure 3-41).
- **Edit** – press to edit the selected file, i.e., TIN, Road, Plane, or Bestfit plane surface.

Figure 3-42. New Surface Filename Dialog Box

- **Delete** – press to remove an existing file from the internal memory.

  Select a file to remove, then press **Delete**.

  The program always reminds the operator to confirm deletion of a selected file. Press **Yes** to confirm the deletion.

Road Surface File

This surface type creates a new road surface with known horizontal, vertical, and template design information.

To configure a new Road surface file, press **New** on the ***Surface(s)*** dialog box (see "Surfaces Dialog Box" on page 3-26), select ***Road (CL, profile, templates)*** on the ***Surface type*** dialog box, and press **Ok** (Figure 3-43).

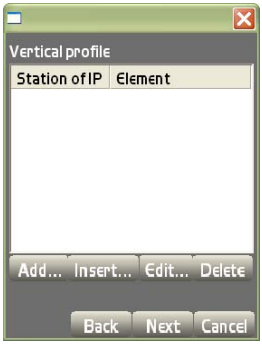


Figure 3-43. Surface Type Dialog Box – Road Surface File

The *point of beginning* dialog box (Figure 3-44 on page 3-30) sets the following parameters. After setting point of beginning parameters, press **Next** to continue.

- Alignment name – enter the name of the Alignment.
- Point of beginning – enter the beginning point.
  - North: enter the northing of the beginning point.
  - East: enter the easting of the beginning point.
  - **Observe**: press to measure the northing and easting of the beginning point instead of manually entering in the values.

    If the project is not localized when creating a new road surface, the **Observe** button will be disabled. Localize the project to measure the point.
- Start station – enter the value for the starting station of the alignment.
- Station interval – enter the value of the station interval of the alignment.

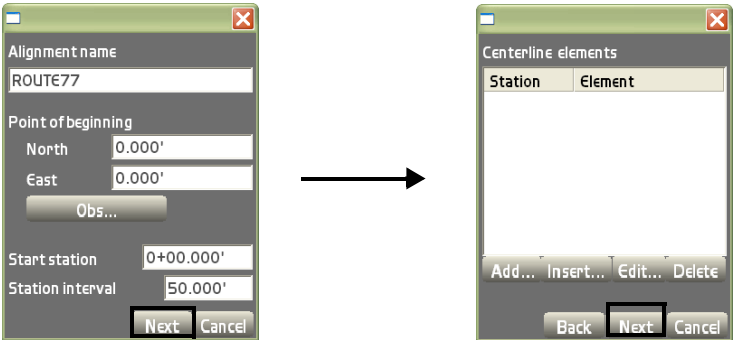


Figure 3-44. Point of Beginning Dialog Box

The *centerline elements* dialog box (Figure 3-44), creates, edits, or deletes alignment elements. After creating station elements, press **Next** to continue.

- **Add** – on the ***centerline elements*** dialog box, press **Add** to enter a new centerline element (Figure 3-45 on page 3-31).
  - Element: select the type of element; either Straight, Curve PC-PT, Spiral TS-SC, or Spiral SC-ST.
  - Start station: the starting station displays at the interval set for each element.
  - Start azimuth: enter the starting azimuth. This box is only available for the first element.
  - Length: enter the length of the element.
  - Obs end pt: press to measure the ending point of the straight element only, instead of manually entering in the values.
  - Radius (in): enter the inner radius of the curve or spiral element.
  - Radius (out): enter the outer radius of the spiral element.

– Curves to the: select the direction, either right or left, in which the curve or spiral element curves.

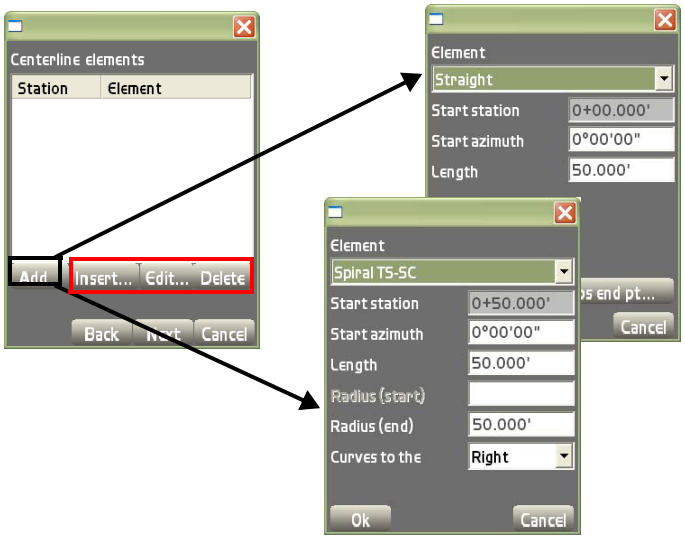


Figure 3-45. Centerline Elements Parameters Dialog Box

- **Insert** –press to add an element above the selected element (Figure 3-45). All following elements will be shifted by the length of the inserted element. See the "Add" bullet on page 3-30 for details on inserting an element.
- **Edit** – press to edit the selected element (Figure 3-45). See the "Add" bullet on page 3-30 for details on editing an element.
- **Delete** – press to remove the selected element (Figure 3-45).

You must define at least three elements to access the Vertical profile dialog box.

The vertical profile dialog box creates, edits, or deletes alignment elements. After creating vertical profiles on the ***Centerline elements*** dialog box (Figure 3-46 on page 3-32), press **Next** to continue. The ***Vertical profile*** dialog box displays (Figure 3-46).

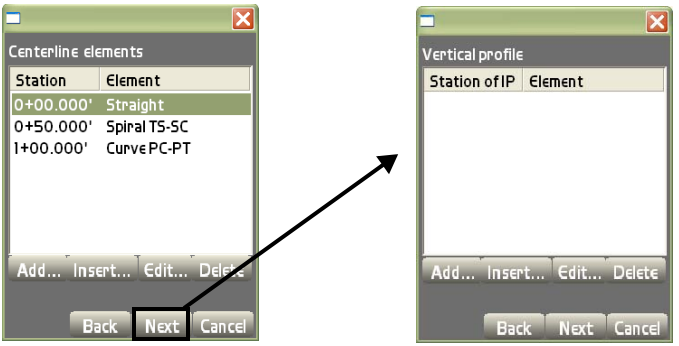


Figure 3-46. Create a Vertical Profile

On the ***Vertical profile*** dialog box, create your vertical profiles:

- **Add** – press to enter an element and its respective information, then press **Ok** to save the information (Figure 3-47 on page 3-33).
  - Element: select the type of element; either Curve or Point.
  - Station: enter the station number.
  - Elevation: enter the elevation of the element.
  - **Observe**: press **Observe** to measure the element, instead of manually entering in the values.
  - Station of IP: enter the station number for the IP (PI).
  - Elevation of PI: enter the elevation for the PI.
  - Curve Length: enter the length of the curve.
  - Grade Start VC: enter the grade at the start of the vertical curve.
  - Grade End VC: enter the grade at the end of the vertical curve.

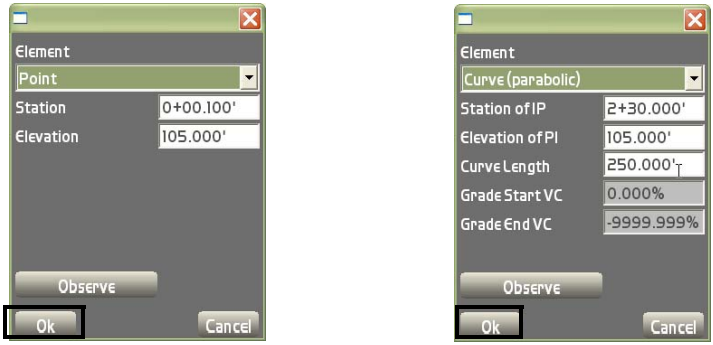


Figure 3-47. Vertical Profile Elements Dialog Box

- **Insert** – on the ***vertical profile*** dialog box (Figure 3-48 on page 3-34), press **Insert** to add an element above the selected element. All following elements will be shifted by the length of the inserted element. See the "Add" bullet on page 3-32 for details on inserting an element.
- **Edit** – on the ***vertical profile*** dialog box (Figure 3-48 on page 3-34), press **Edit** to edit the selected element. See the "Add" bullet on page 3-32 for details on editing an element.
- **Delete** – on the ***vertical profile*** dialog box (Figure 3-48 on page 3-34), press **Delete** to remove the selected element.

The Template definitions dialog box creates, edits, or deletes templates. After creating, editing, or deleting templates on the ***Vertical profile*** dialog box, press **Next** to display the ***template definitions*** dialog box (Figure 3-48 on page 3-34).

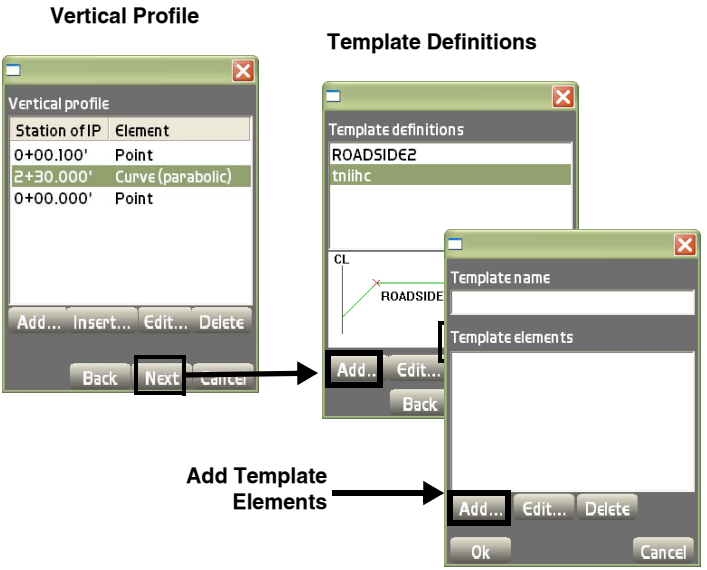


Figure 3-48. Vertical Profile / Template Definitions Dialog Boxes

- **Add** – on the ***template definitions*** dialog box (Figure 3-48), press **Add** display the ***add template elements*** dialog box (Figure 3-48). Add new template definitions (Figure 3-49), then press **Ok** to save the information.

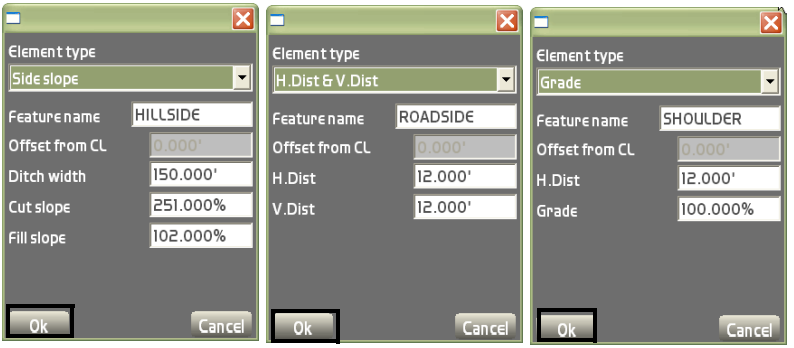


Figure 3-49. Add Template Definitions Dialog Boxes

- **Edit** – on the ***template definitions*** dialog box (Figure 3-50 on page 3-35), press **Edit** to edit the selected template. The ***add templates*** dialog box displays (Figure 3-50). See the "Add" bullet

above for details.

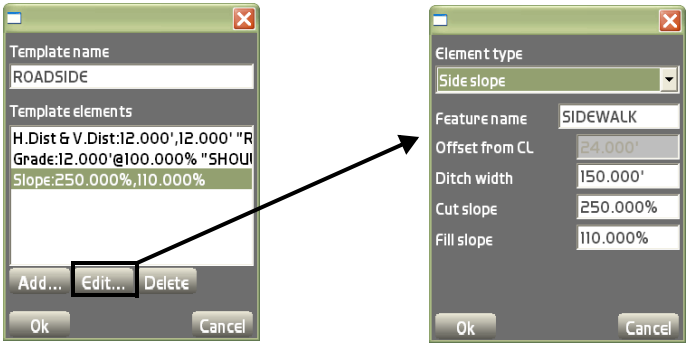


Figure 3-50. Template Definitions / Add Templates Dialog Boxes

- **Delete** – on the ***Template definition***s dialog box (Figure 3-48 on page 3-34), press **Delete** to remove the selected template.

On the ***add templates*** dialog box (Figure 3-51 on page 3-36), press **Add** to enter a template and its respective information, then press **Ok** to save.

- Template name – enter in the name of the Template.
- Template elements – on the ***Template elements*** dialog box, template elements can be created, edited, or deleted. After creating template elements press **Ok** to continue (Figure 3-52 on page 3-37).
- **Add** – On the ***template elements*** dialog box, press **Add** to enter a template element and it's respective information, then press **Ok** to save the information.
- **Edit** – on the ***template elements*** dialog box, press **Edit** to edit the selected element. See the "Add" bullet for details.
- **Delete** – on the ***template elements*** dialog box, press **Delete** to remove the selected element.

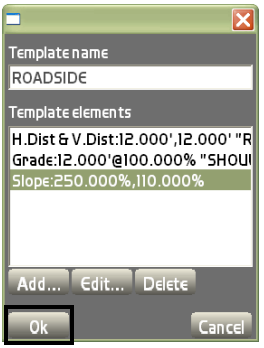


Figure 3-51. Add Templates Dialog Box

On the ***add template elements*** dialog box (Figure 3-51), templates can be created, edited, or deleted. After creating, editing, or deleting templates, press **Ok** to continue (Figure 3-52 on page 3-37).

- Element type – select the type of element; either Offset from CL, Grade, H.Dist & V.Dist, Named feature, Curb, or Side slope.
- Feature name – enter the feature name of the element.
- Offset from CL – enter the offset from the centerline. Note: The first template created will always have zero for the offset.
- H.Dist – enter the horizontal distance of the element. For curbs, this can be zero, or less than zero.
- V.Dist – enter the vertical distance of the element. For curbs, this can be zero, or less than zero.
- Grade – enter the grade of the element.
- Curb grade – enter the curb grade of the element.
- Ditch width – enter the ditch width of the element.
- Cut slope – enter the cut slope of the element.
- Fill slope – enter the fill slope of the element.

Figure 3-52. Add Template Elements Dialog Box (Example)

If only one template has been created, to apply the template to the entire length of the alignment, choose the side(s) of the centerline to which to apply the template, then press **Ok**. Otherwise, press **Cancel** to continue with other operations (Figure 3-53).

Use the ***Apply*** drop-down list to select the application for the alignment; either ***Left of centerline***, ***Right of centerline***, or ***Left and right of CL***.

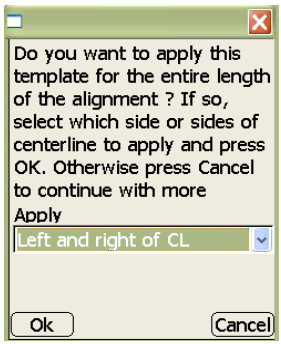

Do you want to apply this template for the entire length of the alignment ? If so, select which side or sides of centerline to apply and press OK. Otherwise press Cancel to continue with more
Apply
Left and right of CL
Ok
Cancel

Figure 3-53. Apply Template to Alignment Dialog Box

You must define at least three Vertical profile elements to access the Template applications dialog box.

The Template applications dialog box creates, edits, and deletes template applications. After creating template applications, press **Next** to continue (Figure 3-54 on page 3-38).

- **Add** – on the ***Template applications*** dialog box(Figure 3-54), press **Add** to enter a template application and it's respective information, then press **Ok** to save the information (Figure 3-54 on page 3-38).
  - – Template: select the template to apply to the alignment.
  - – Side of CL: select the position of the template with respect to the centerline; either ***Left***, ***Right***, or ***Left/Right***.
  - – Station: enter the beginning station for this template.

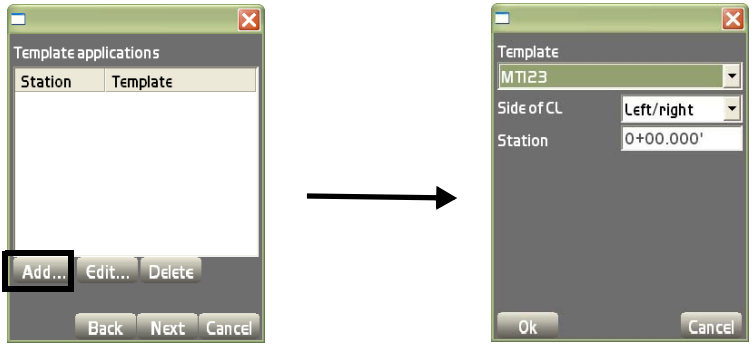


Figure 3-54. Template Applications Dialog Box

- **Edit** – on the ***Template applications*** dialog box(Figure 3-54), press **Edit** to edit the selected template application. See the "Add" bullet for details on editing the application.
- **Delete** – on the ***Template applications*** dialog box, press **Delete** to remove the selected template application.

On the alignment completion dialog box, press **Finish** to save the information (Figure 3-55 on page 3-39).

Figure 3-55. Alignment Completion Dialog Box

Plane Surface File

This surface type creates a planar surface with a point of known elevation and known main-fall/cross-fall slopes.

To configure a new plane surface file, press **New** on the ***Surface(s)*** dialog box. Highlight ***Plane surface (known slopes)*** on the ***Surface type*** dialog box, and press **Ok** (Figure 3-56).

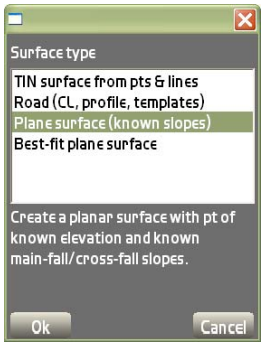

Surface type
TIN surface from pts & lines
Road (CL, profile, templates)
Plane surface (known slopes)
Best-fit plane surface
Create a planar surface with pt of known elevation and known main-fall/cross-fall slopes.
Ok
Cancel

Figure 3-56. Surface Type Dialog Box – Plane Surface

On the plane surface dialog box, enter or select the following information, and press **Ok** (Figure 3-57 on page 3-40).

- Name – enter the name of the plane surface.
- Point on surface – if connected to an instrument, press **Measure** to measure the point; otherwise, manually enter the northing, easting, and elevation for the point.

- Main-fall – enter the main-fall of the surface.
- Main-fall slope – enter the main-fall slope of the surface.
- Main-fall A/B buttons – to automatically calculate the main-fall direction and slope, position the Rover over point A and press **A**. Then position the Rover over point B and press **B**. Otherwise, manually enter the main-fall direction and slope.

  Note: The A->B line should be located along the main-fall direction.

  If the project is not localized when creating a plane surface, the main-fall A/B buttons will be disabled. Localize the project before measuring the point.
- Orientation – enter the orientation of the mainfall.
  - Slope: enter a grid interval for the mainfall and crossfall the sloping plane surface.
  - Grid interval: enter a grid interval for the mainfall and the crossfall.

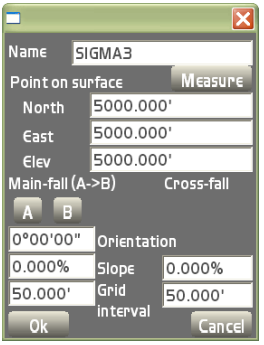


Figure 3-57. Planar Surface Dialog Box

Best-fit Plane Surface File

This surface type creates a planar surface using best-fit calculation through all selected points.

To configure a new plane surface file, press **New** on the ***Surface(s)*** dialog box. Select ***Best-fit plane surface*** on the ***Surface type*** dialog box, and press **Ok** (Figure 3-58 on page 3-41).

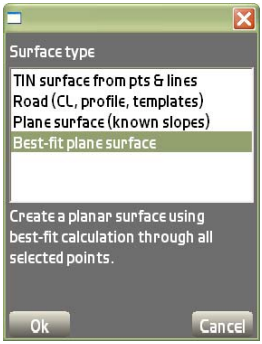

Surface type
TIN surface from pts & lines
Road (CL, profile, templates)
Plane surface (known slopes)
Best-fit plane surface
Create a planar surface using best-fit calculation through all selected points.
Ok
Cancel

Figure 3-58. Surfaces Type Dialog Box – Best-fit Plane Surface

The ***preview*** dialog box displays the Planar Surface created from the selected points and/or lines (Figure 3-59). Press the +/- buttons to zoom in or out on the image, or press down on the screen and drag the image around. Press **Next** to continue.

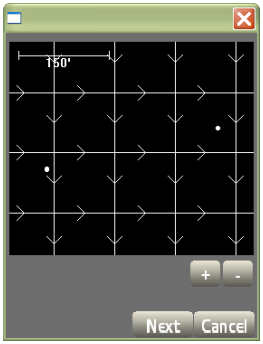


Figure 3-59. Best-fit Plane Surface Preview

On the best-fit plane surface dialog box, enter or select the following information, and press **Finish** (Figure 3-60 on page 3-42).

- Name of Plane surface – enter the name of the Plane surface.
- Grid interval – enter the grid interval.
- Grid orientation – enter the grid orientation.
- Slope east – enter the slope to the east of the surface.
- Slope north – enter the slope to the north of the surface.

- Set as a current surface – enable to set the surface as the current surface.

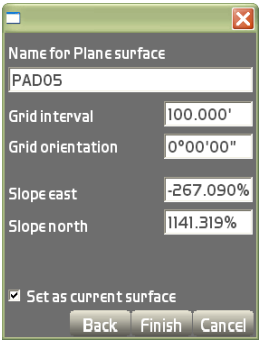


Figure 3-60. Best-fit Plane Surface Parameters

Compare Surface

This menu selection calculates the difference in volume between any two overlapping surfaces. Use the Calculation type to create an existing surface in the field (see “Calculation Wizard” on page 3-84 for more details). This surface can then be used to compare with a proposed design surface or a different existing surface, calculating a volume between the two surfaces.

To compare two existing surfaces, tap **Data ▸ Surface ▸ Compare surface** (Figure 3-61 on page 3-42).

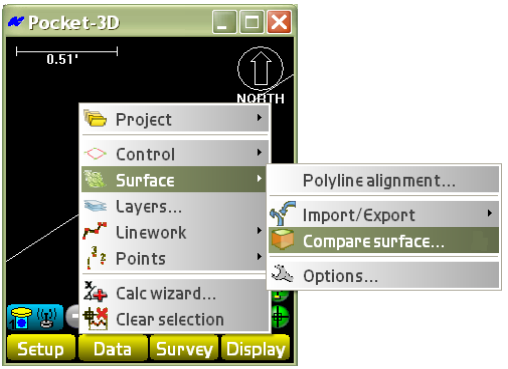


Figure 3-61. Data ▸ Surface ▸ Compare Surface

On the ***compare surfaces*** dialog box, select the over-lapping surfaces to be compared, then press **Next** (Figure 3-62 on page 3-43).

- Design Surface – a design surface has been selected by default from the drop-down list.
- Existing Surface – select the surface to compare from the drop-down list. Remember to choose two over-lapping surfaces.

Figure 3-62. Compare Surfaces

The ***preview*** dialog box displays the elevation differences between the two surfaces (Figure 3-63 on page 3-43). Press the +/- buttons to zoom in or out on the image, or press down on the screen and drag the image around. Press **Finish** to continue.

Figure 3-63. Compare Surface Preview Dialog Box

Press Report to display the ***Volume*** results dialog box. The report screen displays the following results (Figure 3-64): Date, Name of Design Surface, Name of Existing Surface, Common Area, Cut volume, Fill volume, and Volume difference.
To save the information:

1. Press **Save** on the ***Volume report*** dialog box.
2. Enter the name of the text file.
3. Select a folder and location in which to store the text file.
4. Press **Ok**.

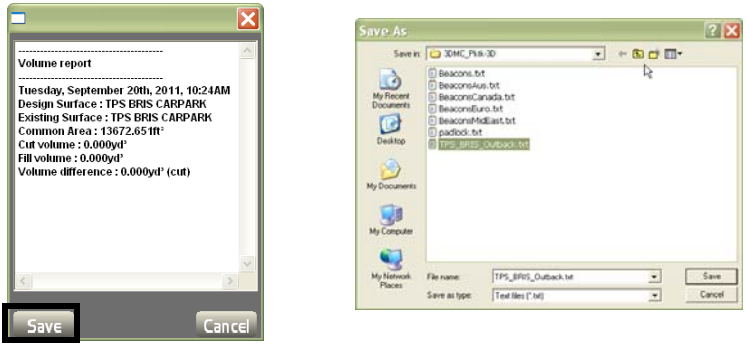


Figure 3-64. Compare Surface Report

Press Display to select the desired parameters for the surface display (Figure 3-65 on page 3-45), then press **Ok**.

- Show contours – enable to display the contour lines at a set interval on the surface.
- Show solid colors – enable to display solid colors at a set interval on the surface.
- Interval – enter the desired contour interval.

- Show grid of cut/fills – enable to display a grid of cut/fills on the surface.

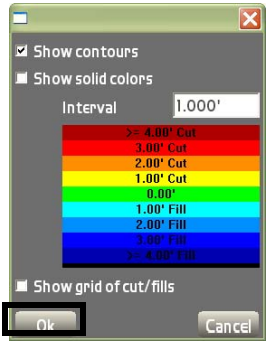


Figure 3-65. Surface Display Parameters

Surface Options

To change the view options of the selected surface, tap **Data ▸ Surface ▸ Options** (Figure 3-66).

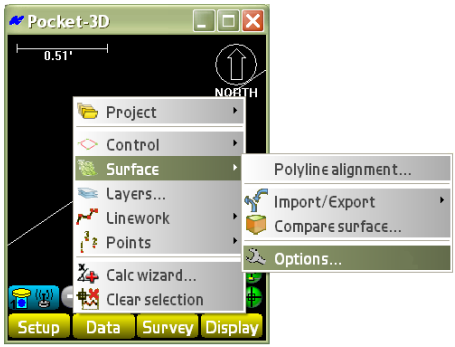


Figure 3-66. Data ▸ Surface ▸ Options

On the ***Options*** dialog box (Figure 3-68 on page 3-47), select the desired options for the selected surface, then press **Ok**. The selected surface type affects the available options.

- TIN Surface Model (Figure 3-67 on page 3-46)
  - – Show triangles: enable to display the triangles on the selected surface. Press the **Color** button to set a color for the triangles.

– Show boundaries: enable to display the boundaries on the selected surface. Press the **Color** button to set a color for the boundaries.

– Show contours: enable to display the contours on the selected surface. Press the **Color** button to set a color for the contours.

– Interval: enter the desired interval for the contours.

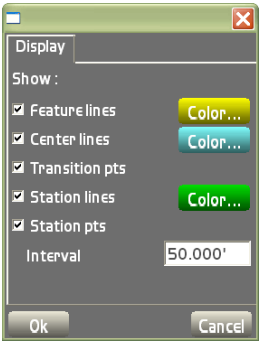


Figure 3-67. TIN Surface Display Options

- Road Surface Model
  – Show feature lines: enable to display the feature lines on the surface. Use the color button to set a color for the feature lines.
  – Use the color button to set a color for the center lines.
  – Show transition pts: enable to display the transition points on the surface.
  – Show station lines: enable to display the station lines at a set interval on the surface. Use the color button to set a color for the station lines.
  – Interval: enter the desired interval for station points.
- Plane Surface Model
  – Display grid-lines: enable to display the grid-lines at a set interval on the surface.
  – Grid interval: enter the desired grid interval.
  – Orientation: enter the desired orientation.
- Best-fit Model

– Display grid-lines: enable to display the grid-lines at a set interval on the surface.
– Grid interval: enter the grid interval for the mainfall.
– Grid interval (crossfall): enter the grid interval for the crossfall.
– Orientation: enter the desired orientation for the mainfall.

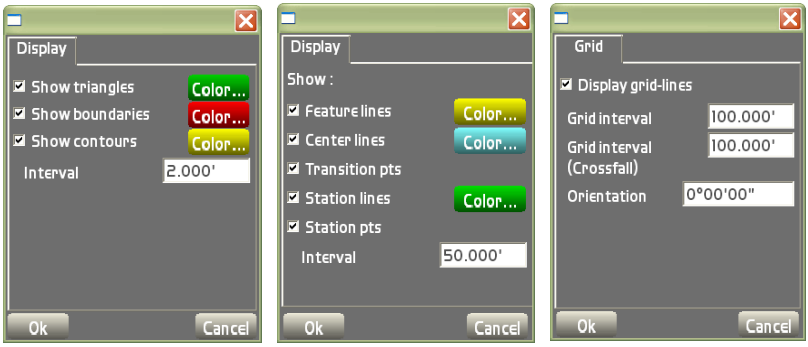


Figure 3-68. Options Dialog Boxes

Alignment

Used in 3D GPS+, Total Station, and Robotic applications to create, edit, and select Alignment files. For Road Surface models, alignment options dialog box displays or hides features lines, transition points, station lines. and station points; changes the color for feature lines, center lines and station lines; and sets the interval for station lines and station points. Alignment files can also be copied between the Pocket-3D controller and the Control Box using a Flash Card.

Alignment files contain the following three elements:

- Horizontal alignments – layout and direction of the road (or X and Y information).
- Vertical profiles – elevations (or Z) for the selected horizontal alignment.
- Cross-section templates – details of the road design.

1. To change the view options of the selected surface, tap **Data ▸ Alignment ▸ Options**.
2. On the **alignment options** dialog box do the following and press **Ok** (Figure 3-69):
   - Feature lines/Center lines – enable to show the feature/center lines on the surface.
   - Transition pts – enable to display the transition points on the surface.
   - Station lines – enable to show the station lines at a set interval on the surface.
   - Station pts – enable to show station points on the main screen.
     – Interval: enter the desired interval for station points.

   Use the **color** buttons on the left to set a color for the enabled option.

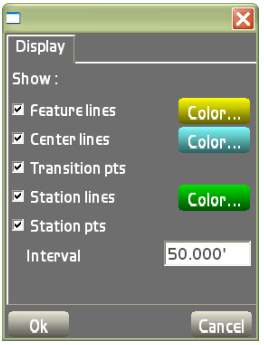


Figure 3-69. Alignment Options – Road Surface Models

Current File or <none>

Displays the currently loaded Alignment file. If no file is currently selected, displays "<none>".

To access available Alignment files or to create a new Alignment file,

tap **Data ▸ Alignment ▸ [<none> or file name]** (Figure 3-70).

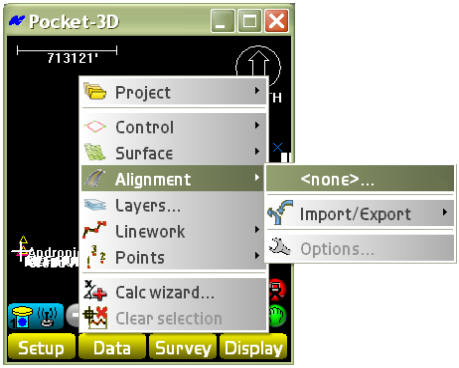


Figure 3-70. Data ▸ Alignment ▸ [File Name]

The ***Surface(s)*** dialog box lists all available Alignment files. To change the currently loaded Alignment file, select another file from the list and press **Ok** (Figure 3-71). At the verification, screen press **Ok** to use this Alignment file for the current project. Alignment files can be created, edited, copied, or deleted.

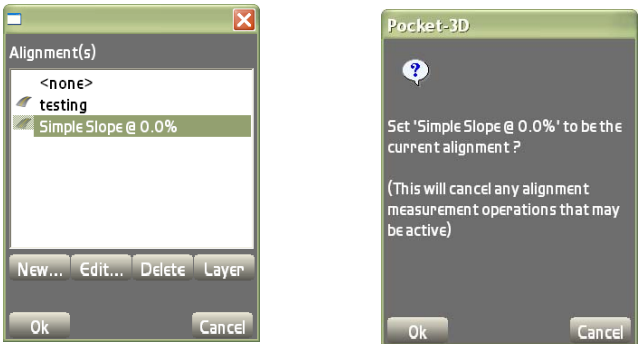


Figure 3-71. Select Alignment File Dialog Box

New

Press **New** to create a new file. On the ***point of beginning*** dialog box (Figure 3-72), enter the following parameters and press **Next**.

- Alignment name – enter the name of the Alignment.
- Point of beginning:

– North: enter the northing of the beginning point.

– East: enter the easting of the beginning point.

– **Obs**: measures the northing and easting of the beginning point, instead of manually entering the values.

- Start station – enter the value for the starting station of the alignment.
- Station interval – enter the value of the station interval of the alignment.

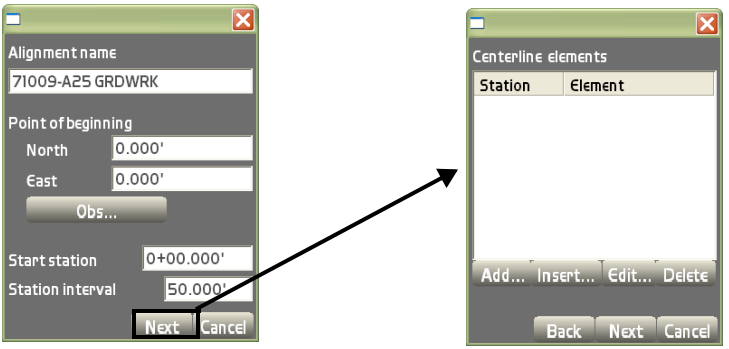


Figure 3-72. Point of Beginning / Centerline Elements Dialog Boxes

The Centerline elements dialog box (Figure 3-73 on page 3-51) creates, edits, or deletes alignment elements. After creating station elements, press **Next** to create vertical profiles (Figure 3-73 on page 3-51).

- **Add** – on the ***Centerline elements*** dialog box, press **Add** to enter an element and its respective information, then press **Ok** to save the information (Figure 3-72).
  – Element: select the type of element; either ***Straight, Curve PC-PT, Spiral TS-SC,*** or ***Spiral SC-ST***.
  – Start station: the starting station displays at the interval set for each element.
  – Start azimuth: enter the starting azimuth. This field is only available for the first element.
  – Length: enter the length of the element.

– **Obs end pt**: press **Obs end pt** to measure the ending point of the straight element only, instead of manually entering in the values.

– Radius (start): enter the inner radius of the curve or spiral element.

– Radius (end): enter the outer radius of the spiral element.

– Curves to the: select the direction, either right or left, in which the element curves.

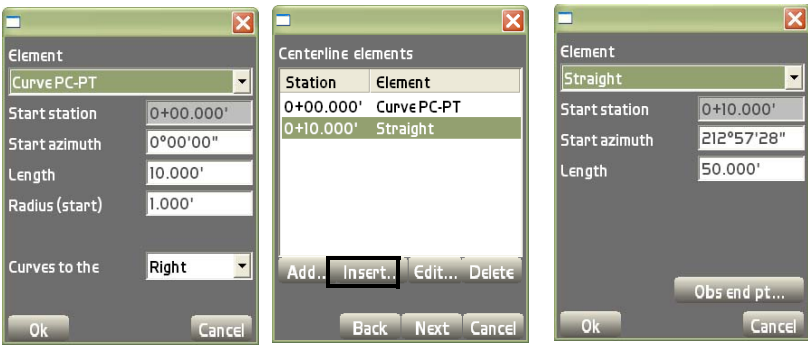


Figure 3-73. Centerline Element Parameters

- **Insert** – on the ***Centerline elements*** dialog box (Figure 3-73), press **Insert** to add an element above the selected element. All following elements will be shifted by the length of the inserted element. See the "Add" bullet on page 3-50 for details on inserting an element.
- **Edit** – on the ***Centerline elements*** dialog box, press **Edit** (Figure 3-73) to edit the selected element. See the "Add" bullet on page 3-50 for details on editing an element.
- **Delete** – on the ***centerline elements*** dialog box (Figure 3-73), press **Delete** to remove the highlighted element.

The Vertical profile dialog box (Figure 3-74 on page 3-52) creates, edits, or deletes alignment elements. After creating vertical profiles, press **Next** to display the ***Template definitions*** dialog box (Figure 3-74 on page 3-52).

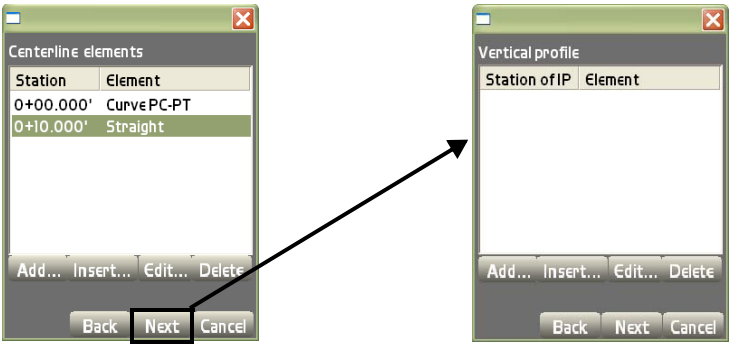


Figure 3-74. Create a Vertical Profile

- **Add** – on the ***vertical profile*** dialog box (Figure 3-74), press **Add** to enter an element and its respective information, then press **Ok** to save the information.
  - Element: select the type of element; either ***Point*** or ***Curve*** (Figure 3-75 on page 3-53).
  - Station: enter the station number.
  - Elevation: enter the elevation of the element.
  - **Observe**: press to measure the element instead of manually entering the values (Figure 3-75 on page 3-53).
  - Station of IP: enter the station number for the IP.
  - Elevation of PI: enter the elevation for the PI.
  - Curve Length: enter the length of the curve.

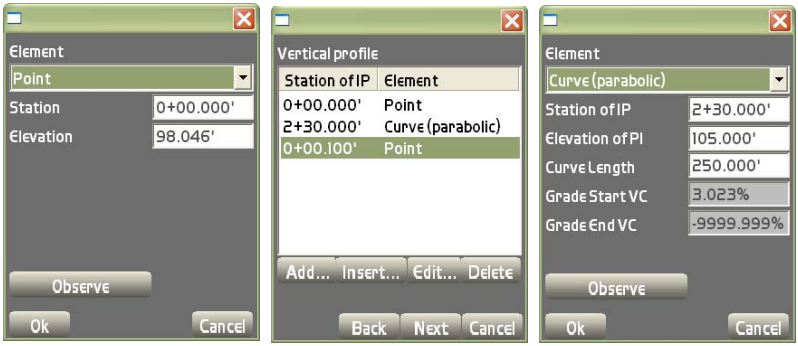


Figure 3-75. Vertical Profile Parameters

- **Insert** – on the ***Vertical profile*** dialog box (Figure 3-74 on page 3-52), press **Insert** to add an element above the selected element. All following elements will be shifted by the length of the inserted element. See the "Add" bullet on page 3-52 for details on inserting an element.
- **Edit** – on the ***Vertical profile*** dialog box (Figure 3-74 on page 3-52), press **Edit** to edit the selected element. See the "Add" bullet page 3-52 and Figure 3-74 on page 3-52 for details on editing the element.
- **Delete** – on the ***Vertical Profile*** dialog box (Figure 3-75 on page 3-53), press **Delete** to remove the selected element.

The Template definitions dialog box (Figure 3-76 on page 3-54) creates (adds), edits, or deletes templates. After creating templates, press **Next** to display the ***Template applications*** dialog box (Figure 3-78 on page 3-55).

- **Add** – on the ***Template definitions*** dialog box, press **Add** to enter a template and its respective information, then press **Ok** to save the information. Follow the same process as shown on page 3-33.
- **Edit** – on the ***Template definitions*** dialog box, press **Edit** to edit the selected template. Follow the same process as seen on page 3-33.

- **Delete** – on the ***Template definitions*** dialog box, press **Delete** to remove the selected template.

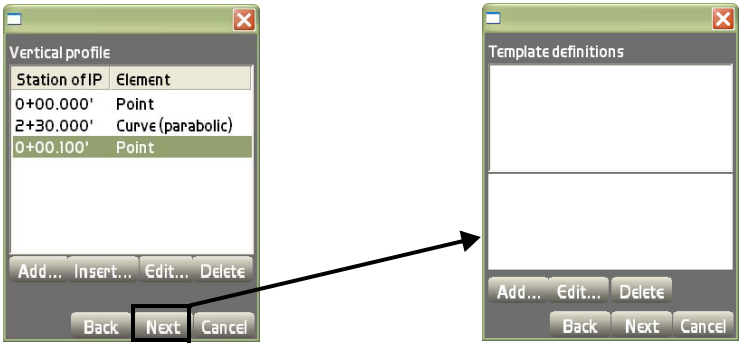


Figure 3-76. Template Definitions Dialog Box

If only one template has been added, to apply the template to the entire length of the alignment, choose the side(s) of the centerline to which to apply the template, then press **Ok**. Otherwise, press **Cancel** to continue with other operations (Figure 3-77).

Use the ***Apply*** drop-down list to select the application for the alignment; either ***Left of centerline***, ***Right of centerline***, or ***Left and right of CL***.

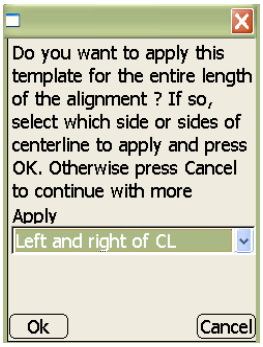

Do you want to apply this template for the entire length of the alignment ? If so, select which side or sides of centerline to apply and press OK. Otherwise press Cancel to continue with more
Apply
Left and right of CL
Ok
Cancel

Figure 3-77. Apply Template to Alignment

The *Template applications* dialog box creates, edits, or deletes template applications. After creating template applications press **Next** to continue (Figure 3-78 on page 3-55).

- **Add** – on the ***Template applications*** dialog box, press **Add** to enter a template application and it's respective information, then press **Ok** to save the information. Follow the same process as seen on page 3-38.
- **Edit** – on the ***Template applications*** dialog box, press **Edit** to edit the selected template application. Follow the same process as shown on page 3-38.
- **Delete** – on the ***Template applications*** dialog box, press **Delete** to delete the selected template application.

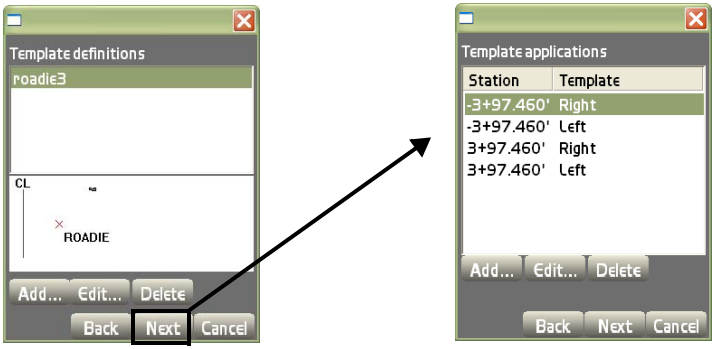


Figure 3-78. Template Applications Dialog Box

On the ***Alignment complete*** dialog box, press **Finish** to save the information (Figure 3-79).

Figure 3-79. Press Finish

Edit

To edit an alignment file, select the desired file, then press **Edit**. Follow the same process as for a new alignment file (see “New” on page 3-49).

Delete

The **Delete** button removes an existing file from internal memory. The touch screen lists all files available for deletion.

To remove a file, select the desired file, then press **Delete**.

The program always confirms the deletion of a selected file. Select **Yes** to confirm the deletion.

Import/Export

To import an alignment file, tap **Data ▸ Alignment ▸ Import/Export** (Figure 3-80).

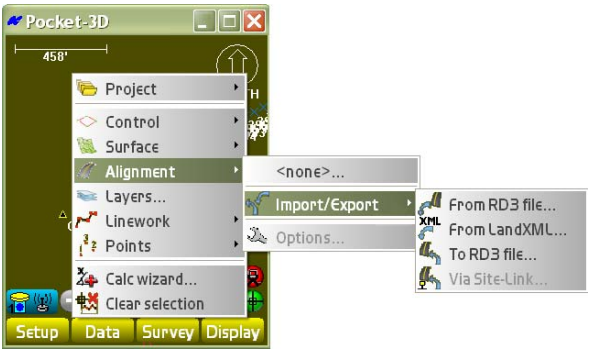


Figure 3-80. Import/Export an Alignment File

From RD3 File

To import a Topcon Road file (RD3) as an alignment file, tap **Data ▸ Alignment ▸ Import/Export ▸ From RD3 file (**Figure 3-81 on page 3-57).

Figure 3-81. Import from a Topcon Road File

The ***file explorer*** dialog box displays (Figure 3-82).

- Choose an RD3 file from the drop-down list in the ***Look in*** field.
- Press **Open**

  A confirmation dialog box displays to confirm that the file was successfully imported.

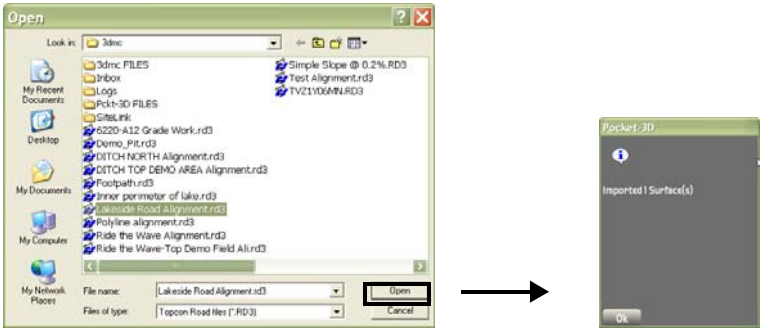


Figure 3-82. Import Topcon Road File from Explorer Dialog Box

From LandXML File

To export a LandXML file from an alignment file, click **Data ▸ Alignment ▸ Import/Export ▸ From LandXML (**Figure 3-83**).**

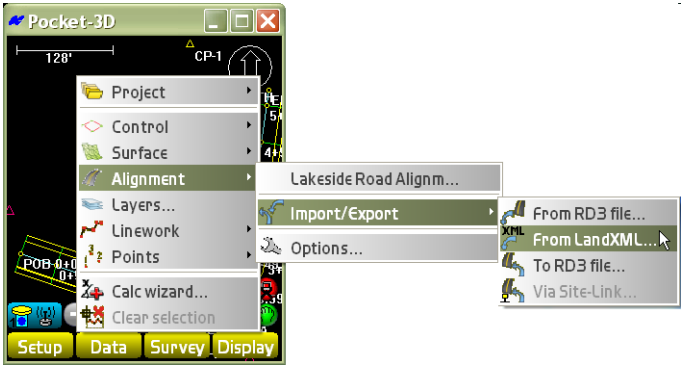


Figure 3-83. Import from a LandXML File

On the Source filename dialog box, press the Browse button to select an XML file for the Explorer dialog box.

Press Open to return to the previous screen, then cancel to return to the main screen.

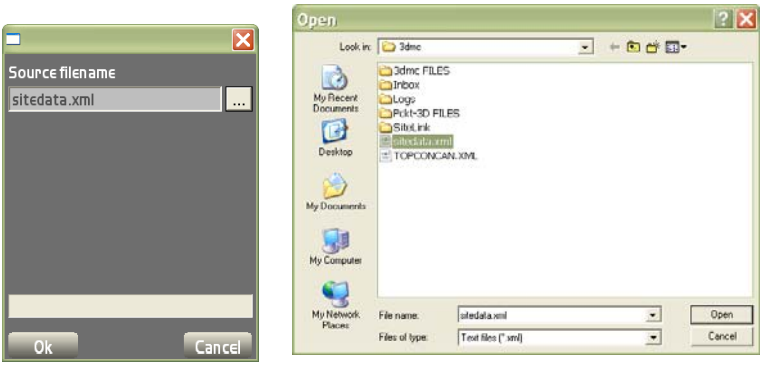


Figure 3-84.

To RD3 File

To export an RD3 file from an alignment file, click **Data ▸ Alignment ▸ Import/Export ▸ To RD3 file** (Figure 3-85 on page 3-59).

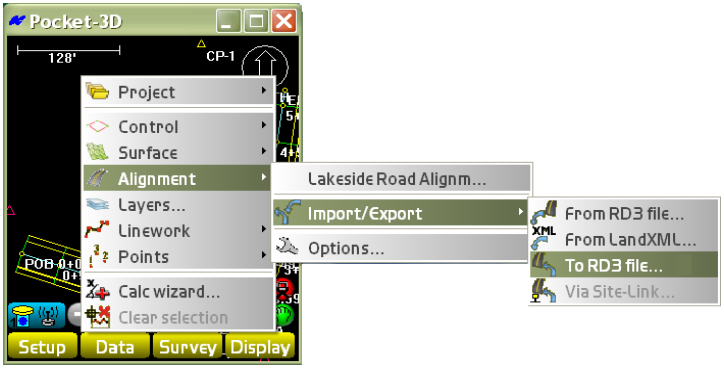


Figure 3-85. Export a Surface File to RD3 File

- The ***Surface(s)*** dialog box displays (Figure 3-86). Highlight a surface file to export.
- Press **Export**.

  A confirmation dialog box displays to confirm that the export was successful (Figure 3-86).

Figure 3-86. Exporting to an RD3 File

Options

To change the view options of the selected alignment, tap **Data** ▸ **Alignment** ▸ **Options** (Figure 3-87 on page 3-60).

Figure 3-87. Data ▸ Alignment ▸ Options

On the ***alignment options*** dialog box (Figure 3-88), select the desired options for the alignment, then press **Ok**.

- Show feature lines – enable to display feature lines.
- Show transition pts – enable to display transition points.
- Show station lines – enable to display station lines.
- Interval – enter the interval desired for the station lines.
- Color buttons – press to set a color for feature/center/station lines.

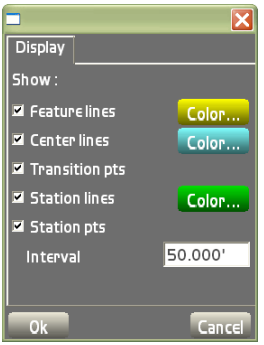


Figure 3-88. Options

Layers

To add, edit, or delete a layer within the current Linework file, tap **Data ▸ Layers** (Figure 3-89 on page 3-61).

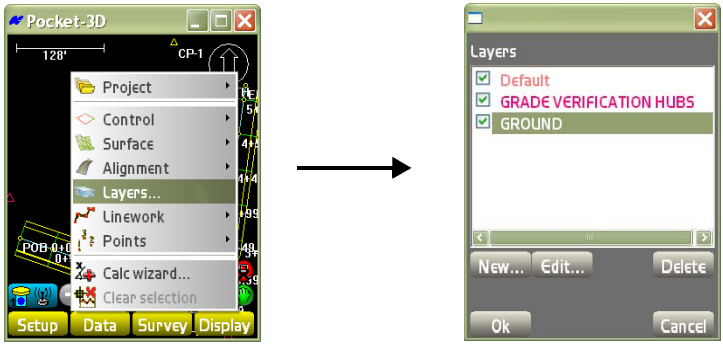


Figure 3-89. Data ▸ Linework ▸ Layers

The ***Layers*** dialog box displays all layers within the selected file (Figure 3-90 on page 3-62).

- **New** – press **New** to create a layer (Figure 3-90 on page 3-62). The ***Layer name*** dialog box displays. Enter or select the layer parameters:
  - Layer name: enter the name of the layer.
  - Show point numbers: enable to display on the main screen point numbers for all points within the layer.
  - Show point descriptions: enable to display on the main screen point descriptions for all points within the layer.
  - Show point elevations: enable to display on the main screen point elevations for all points within the layer.
- Symbol – select the type of symbol desired for the Point layer.
- **Color** – press to select the desired color for the symbol (if preferred), then press **Ok**

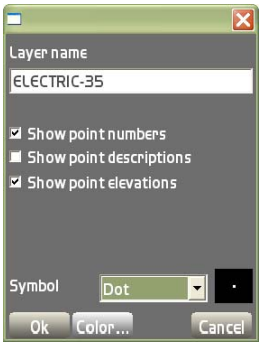


Figure 3-90. alignment Layers Options

- **Edit** – on the ***Layers*** dialog box (Figure 3-89 on page 3-61), press to edit the selected layer. See the "New" bullet and Figure 3-90 for details on editing the layer.
- **Delete** – on the ***Layers*** dialog box (Figure 3-89 on page 3-61), press to remove the selected layer.

Linework

Used in 3D GPS+, Total Station, Robotic applications, and 3D LPS applications, the Linework menu creates, edits, and deletes Linework files. Linework files can also be copied between the Pocket-3D and the Control Box using a Flash Card.

Linework files contain layers comprised of polylines identified with different names and colors. The linework represents features or objects on the project, such as building pads, curbs and sidewalks, top and toe of slopes, or the boundary of the project.

If a linework file imported from 3D-Office to Pocket-3D contains text, that text displays on the main screen as well.

Current File or <none>

Displays the currently loaded Linework file. If no file is currently loaded, "<none>" displays.

To access available Linework files or to create a new Linework file, tap **Data ▸ Linework ▸ Listing** (Figure 3-91).

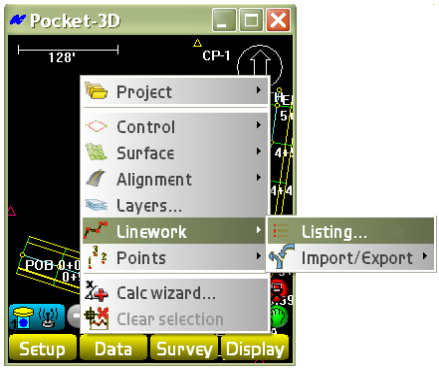


Figure 3-91. Data ▸ Linework ▸ [<none> or file name]

The ***layer files*** dialog box (Figure 3-92) displays the selected layout menu, showing the current list of layouts, the number of segments, and the status for the selected layout. To create a new polyline, press **New**.

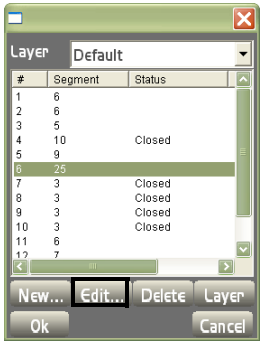


Figure 3-92. Select a Layout File

- **New** – on the ***layer files*** dialog box (Figure 3-92), press to create a new polyline. The ***Create new polyline*** dialog box displays (Figure 3-93 on page 3-64). Create a new polyline, then press **Ok** to save the information.
  - – Add to layer: from the drop-down box, select a layer to create a new polyline.
  - – **From Point:** press to select the beginning point.

– **To Point:** press to select the end point.

– **Measure**: press to measure the beginning of end points.

– **Inverse arrows** : press to reverse the direction of the beginning line.

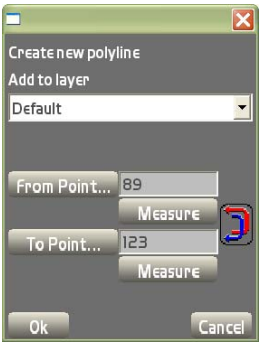


Figure 3-93. New Polyline File

- **Edit** – on the ***layer files*** dialog box (Figure 3-94), highlight a segment (straight or curved), then press **Edit**

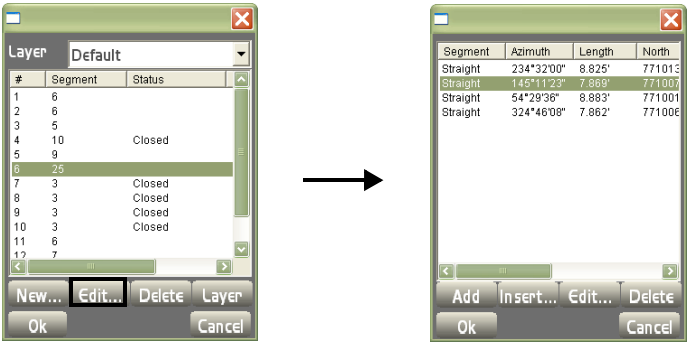


Figure 3-94. Edit Layer Files

On the ***segments*** dialog box (Figure 3-95), highlight a segment and press **Add** to edit either a Curved segment or a Straight segment.

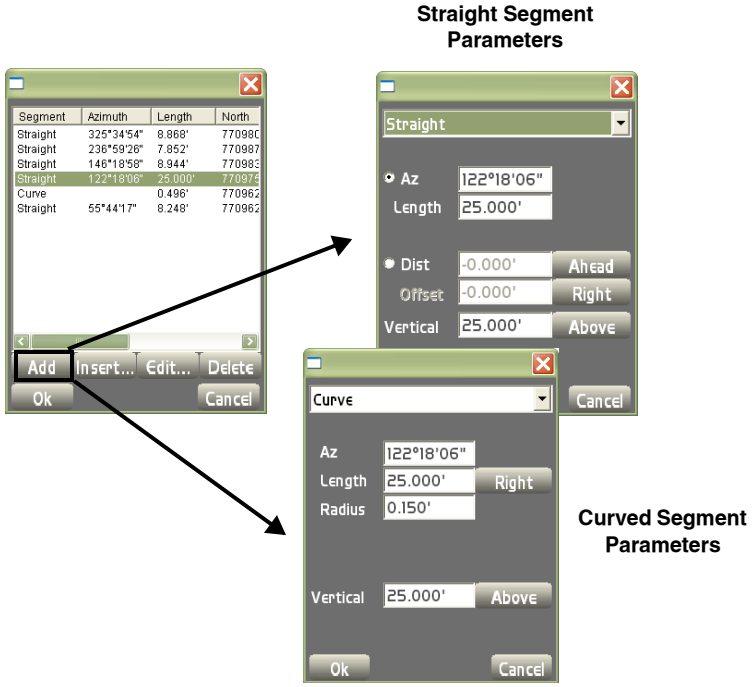


Figure 3-95. Segment Dialog Boxes – Curved/Straight

- **Delete** – on the ***layer files*** dialog box (Figure 3-94 on page 3-64), highlight a layout to remove and press **Delete**.
- **Layer** – press to display the ***Add to layer*** dialog box. From the drop-down list, select a layer to add a new polyline (Figure 3-96 on page 3-66).

Figure 3-96. Add a New Layer to Polyline

Press **Ok** to return to the ***layer file s*** dialog box (Figure 3-95 on page 3-65).

Import/Export

To Import a linework file, tap **Data** ▸ **Linework** ▸ **Import/Export** (Figure 3-97).

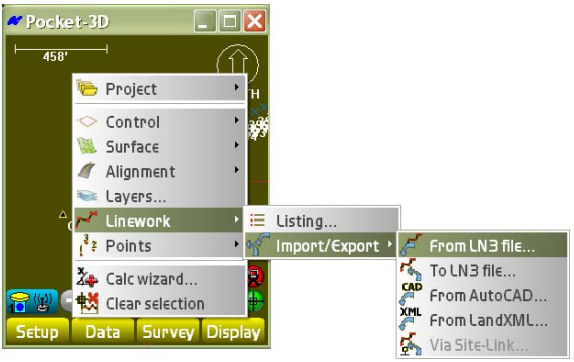


Figure 3-97. Import a Linework File

From LN3 file To import a linework file from an existing LN3 file, tap **Data** ▸ **Linework** ▸ **Import/Export** ▸ **From LN3 file** (Figure 3-97).
The ***Source filename*** dialog box displays (Figure 3-98).
Press the **Browse** button to display the ***file explorer*** dialog box;

(Figure 3-98). Navigate to and select the Topcon linework file (LN3) to import, then press **Ok**.

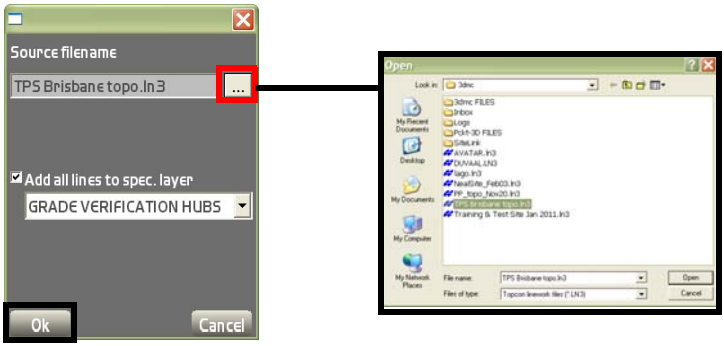


Figure 3-98. Files Explorer Dialog Box

- On the ***confirmation*** dialog box, press Ok to confirm the import of selected linework files (Figure 3-99).

Figure 3-99. Export Linework Confirmation Screen

To LN3 file To export a linework file tap **Data ▸ Linework ▸ Import/ Export ▸ To LN3 file** (Figure 3-100).

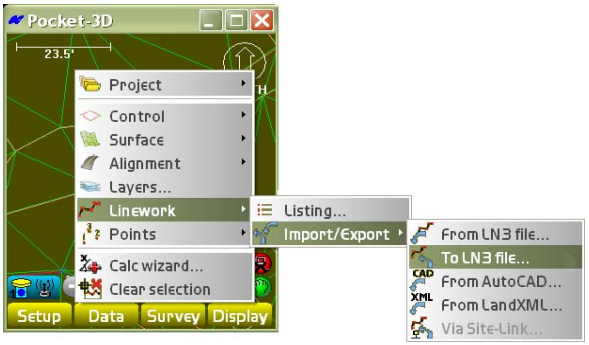


Figure 3-100. Export a Linework File

- The ***linework export*** dialog box displays ("Export to LN3 File" on page 3-68). Select one of the following export methods:
  - ***All lines***: Select the **browse** button (...) to determine the export destination and enter a name for the file.
  - ***By layer***: Select the layers to export, then select the **browse** button (...) to determine the export destination and enter a name for the file.
- Press **OK** to save.

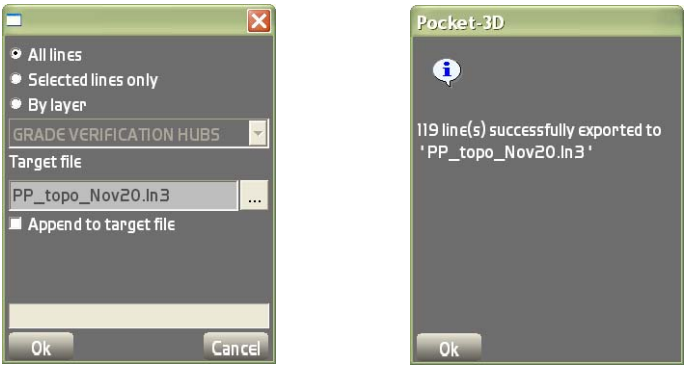


Figure 3-101. Export to LN3 File

- Press **Ok**, then press **Ok** again on the ***confirmation*** dialog box (Figure 3-101).

From AutoCAD To Import an AutoCAD file into the Linework file, click **Data ▸ Linework ▸ Import/Export ▸ From AutoCAD** (Figure 3-102).

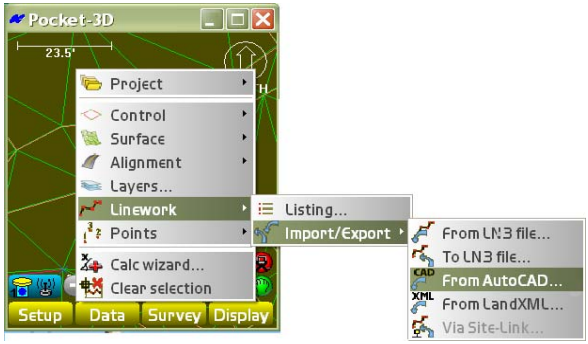


Figure 3-102. Import an AutoCAD File

On the ***Source filename*** dialog box, press the **browse** (...) button to browse to select and import the AutoCAD (.dxf) file. The AutoCAD file then displays in the ***Source text file*** entry box (Figure 3-103).

Figure 3-103. Import from AutoCAD File

Press **Ok** to confirm that the files have been successfully imported, then press **Ok** again.

From LandXML to export an Excel file.
Click **Data ▸ Linework ▸ Import/Export ▸ From LandXML file.**

1. On the ***Source filename*** dialog box, press the **Browse** ... button.
2. On the ***file explorer*** dialog box, select the ***.XML*** file to export, then press **Open**.

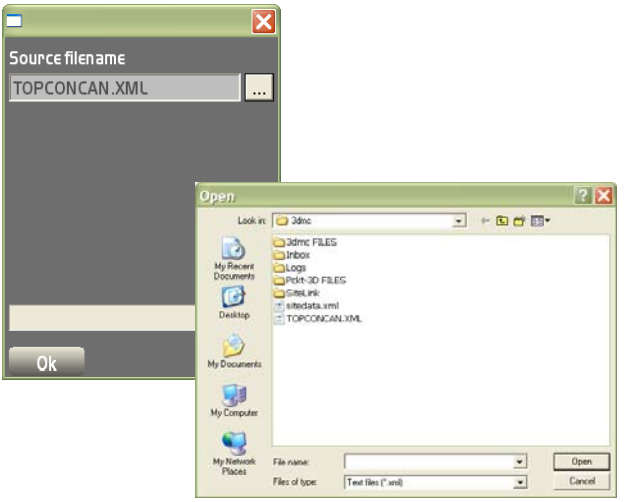


Figure 3-104. Import/Export a LandXML File

Via Site-Link export a linework file via Site-Link.

1. Click **Data ▸ Linework ▸ Import/Export ▸ Via Site-Link.**
2. On the ***Lineworks*** dialog box (Figure 3-105 on page 3-71), choose either ***None***, ***All polylines***, ***Selected polylines only***, or ***Polylines by layer*** to import/export.
3. Press **Next** to display the ***To:*** dialog box.
4. Double-click on the mouse to select a file to Import to.

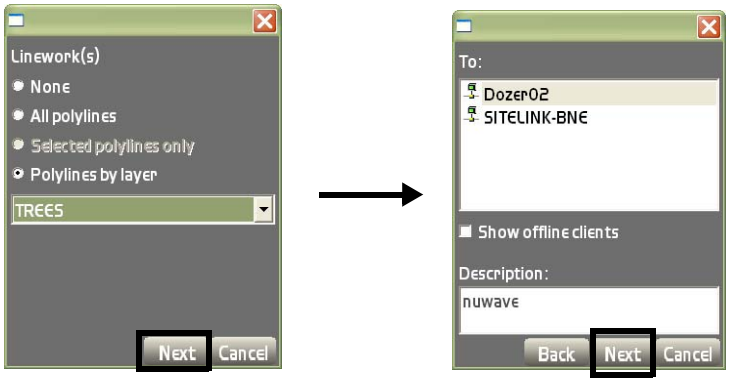


Figure 3-105. Import a Linework File

5. Press **Next**.
6. On the **Import** dialog box (Figure 3-106), check mark the ***Import into recipient's current active project*** box to send the linework/ polylines directly to the recipient's project.
7. Check mark the ***Replace all lines in layer w.same name*** box to prevent duplicate names.
8. Press **Next**.
9. On the ***Send:*** dialog box (Figure 3-106), press **Finish** to send the save and return to the main screen.

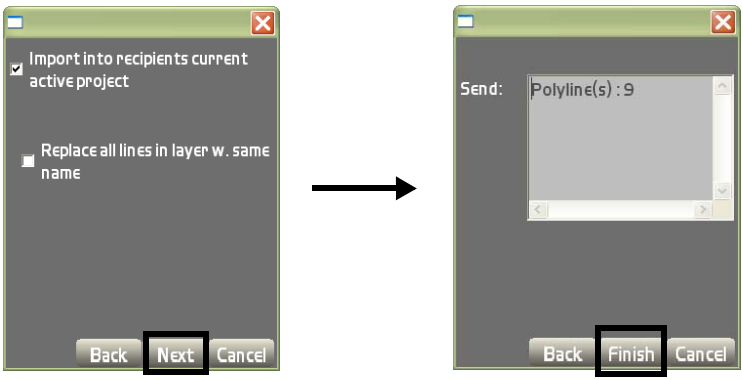


Figure 3-106. Importing Polylines

Points

Used in 3D GPS+, Total Station, and Robotic applications, the Points menu creates, edits, and deletes Point files. Point files can also be copied between Pocket-3D and the Control Box using a Flash Card. Point files contain multiple groups of points, measured with their coordinates, and put together into a layer as with Linework files.

Listing

To add, edit, or delete a point with the selected Point file, do the following:

- Click **Data** ▸ **Points** ▸ **Listing** (Figure 3-107).

  The ***points listing*** dialog box (Figure 3-108 on page 3-73) displays all points within the selected file.

Figure 3-107. Create, Edit, and Delete Point Files

- Press **Add** to display the ***points parameters*** dialog box (Figure 3-109 on page 3-74).

Figure 3-108. Points Listing Dialog Box

On the ***points parameters*** dialog box (Figure 3-109 on page 3-74) enter or select the following parameters:

- **Add** – on the ***points listing*** dialog box (Figure 3-108), press to enter a point and its respective information, then press **Ok** to save the information (Figure 3-109 on page 3-74) and return to the points listing dialog box (Figure 3-108).
  - Pt. number: enter the point number.
  - Description: select a point description from the drop-down box (if preferred)
  - Layer: select a layer in which to store the point.
  - North/East/Elev: in each entry box, enter the coordinates for ***Northing/X (North), Easting/Y (East),*** and ***Elevation/Z (Elev)***.
- **Edit** – on the ***points listing*** dialog box (Figure 3-108, press to edit the selected point. See the "Add" bullet above and Figure 3-109 on page 3-74 for details.
- **Delete** – on the ***points listing*** dialog box (Figure 3-108 on page 3-73) press to remove the selected point.

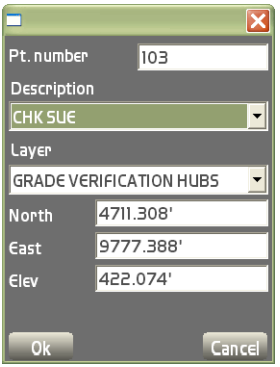


Figure 3-109. Points Parameters Dialog Box

Conversion Formats

To create, edit, or delete a conversion format, tap **Data ▸ Points ▸ Import/Export ▸ From text file**.

Figure 3-110. Create a Conversion Format

Press **Format** on the ***Source text file*** dialog box. The ***Conversion formats*** dialog box displays (Figure 3-111 on page 3-75). To convert formats, do the following:

- **New** – on the ***Conversion formats*** dialog box, press **New** to enter a conversion format and it's respective information, then press **Ok** to save the information (Figure 3-112 on page 3-76). See "The Line Items" and "The Import Rules" on page 3-20 for

information on the tabs.

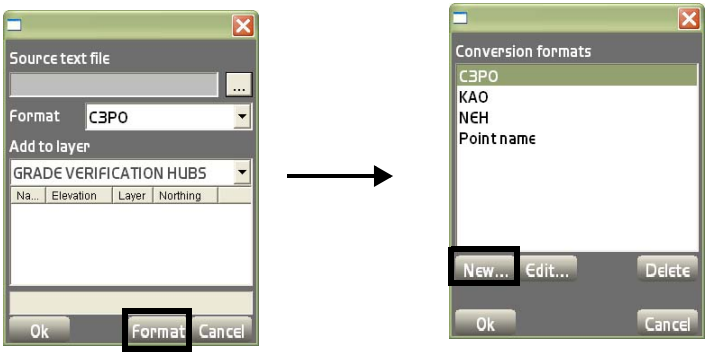


Figure 3-111. Conversion Formats/Conversion Format Parameters Dialog Boxes

- **Edit** – on the ***Conversion formats*** dialog box (Figure 3-111 on page 3-75), press to edit the selected format. The ***conversion formats parameters*** dialog box displays (Figure 3-112 on page 3-76).
- **Delete** – on the ***Conversion formats*** dialog box, press to delete the highlighted (selected) format.

On the ***conversion formats parameters*** dialog box, select parameters on the ***Line Items*** and ***Import rules*** tabs.

The Line items tab on the ***conversion formats parameters*** dialog box adds, edits, or deletes line items for the selected conversion format (Figure 3-112 on page 3-76).

- **Add** – on the ***Line items*** tab, press to add a line item and it's respective information, then press **Ok** to save (Figure 3-112 on page 3-76). Repeat this process for each line item.
  - Type: select either ***Point name, Point description, Point northing, Point easting, Point elevation, Point layer name, Literal text string, Point WGS84 latitude, Point WGS84 longitude,*** or ***Date/Time***.
  - Append: select either ***Trailing comma, Trailing space, Trailing tab,*** or ***Nothing.***
  - Fixed width field: enable to select a fixed width for each field.
  - Justified: select either ***Left, Right,*** or ***None***.

– Width: enter the width of the field.

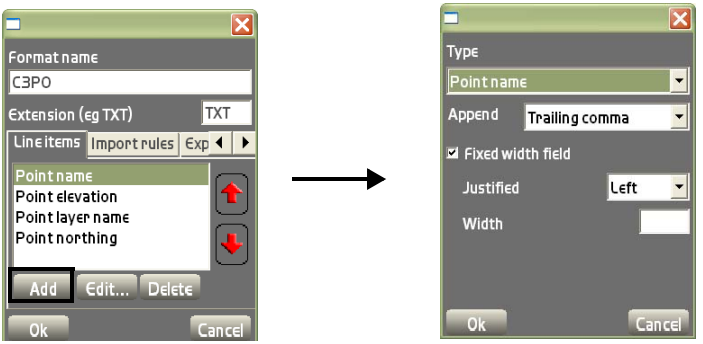


Figure 3-112. Enter Line Item Information

- **Edit** – on the ***Line items*** tab (Figure 3-112), press to edit the selected line item. See the "Add" bullet on page 3-75 and Figure 3-112 above for details on editing the line item.
- **Delete** – on the ***Line items*** tab (Figure 3-112), press **Delete** to delete the selected line item.

The Import rules tab on the conversion formats parameters dialog box adds, edits, or deletes import rules for the selected conversion format (Figure 3-113 on page 3-77).

- **Add** – on the ***Import rules*** tab (Figure 3-113 on page 3-77), press to display the import rules dialog box. displays to add an import rule and it's respective information, then press **Ok** to save the information (Figure 3-113 on page 3-77).
  - – Rule: select either ***Skip header lines*** or ***Skip prefixed lines***.
  - – Number of lines: enter the desired number of header lines to skip during import.
  - – Prefix: enter the desired number of prefixed lines to skip during import

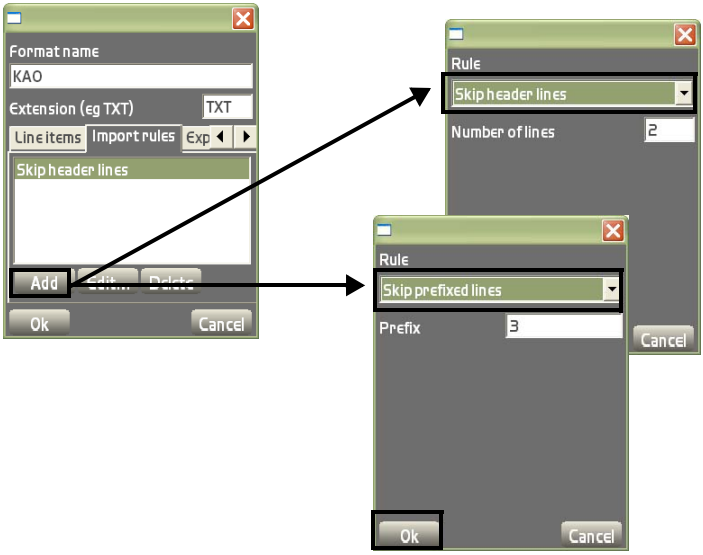


Figure 3-113. Conversion Formats Parameters / Import Rule Parameters

- **Edit** – on the ***Import rules*** tab, press **Edit** to edit the selected import rule. See the "Add" bullet and Figure 3-114 for details on editing the import rule.
- **Delete** – on the ***Import rules*** tab, press **Delete** to remove the selected import rule.

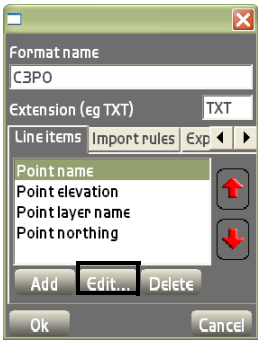


Figure 3-114. Line Items Tab

From TP3 File To import points from a Topcon Project(TP3) file, tap **Data ▸ Points ▸ Import/Export ▸ From TP3 file (**Figure 3-115**)**.

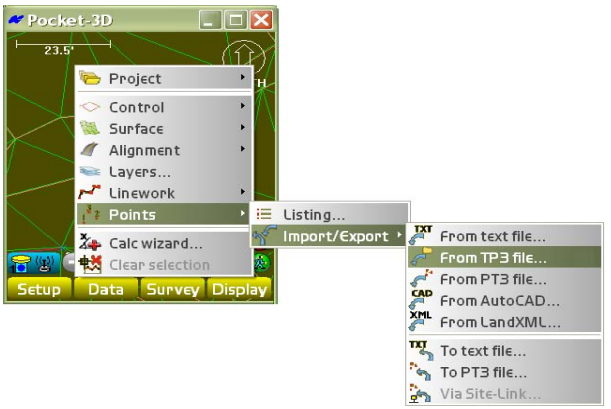


Figure 3-115. Import a TP3 File

See “Control Point Options” on page 3-21 for details on importing control points from a TP3 file.

From PT3 File To import points from a Topcon Point (PT3) file, tap **Data ▸ Points ▸ Import/Export ▸ From PT3 file (**Figure 3-116**)**.

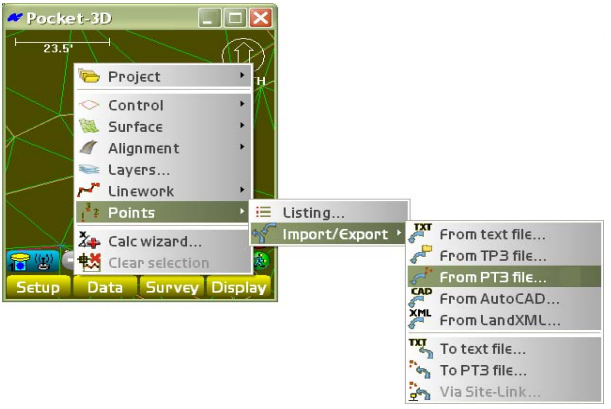


Figure 3-116. Import a PT3 File

See “Control Point Options” on page 3-21 for details on importing control points from a PT3 file.

From AutoCAD To import points from an AutoCAD (.dxf) file, tap **Data ▸ Points ▸ Import/Export ▸ From AutoCAD** (Figure 3-117).

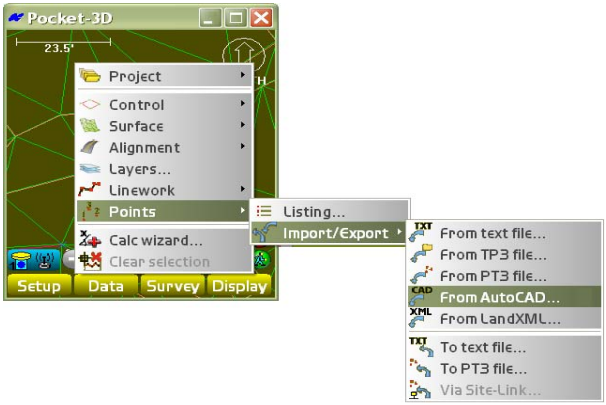


Figure 3-117. Import Points From an AutoCAD File

The ***Source filename*** dialog box displays (Figure 3-118).

- Source filename – press the **browse** (...) button to import the points from the AutoCAD (.dxf) file. The AutoCAD file will then display in the ***Source filename*** entry box.
- Start from point ID – enter a point ID for the point number at which the imported points will begin.
- Description – enter a description for the imported points.

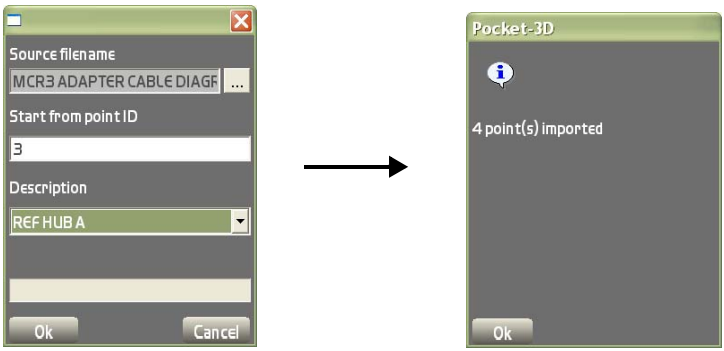


Figure 3-118. Import Points From an AutoCAD File

From LandXML To import points from a LandXML (.xml) file, tap **Data ▸ Points ▸ Import/Export ▸ From LandXML**.

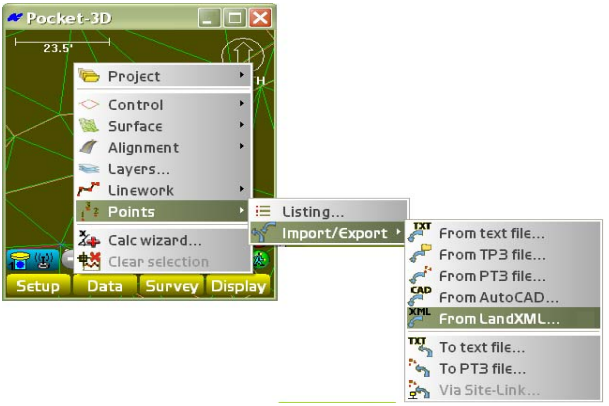


Figure 3-119. Import Points From a LandXML File

The ***Source filename*** dialog box displays (see Figure 3-118 on page 3-79 for details).

Export Point Files

To export point files, tap **Data ▸ Points ▸ Import/Export** (Figure 3-120).

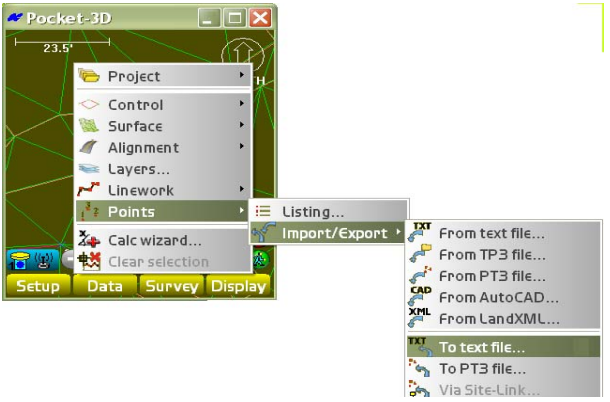


Figure 3-120. Export Point Files

To Text file To export text files to a point file, tap **Data ▸ Points ▸ Import/Export ▸ To text file**. The ***export to text file*** dialog box displays (Figure 3-121). Unless otherwise selected, the default folder for exported point files will be the "My Documents" folder on the controller.

- All points – enable to export all of the points within the Points file.
- Selected points only – with the desired points selected, enable to export only those points to a text file.
- By layer – enable to export all of the points within a selected layer.
- Target text file – press the **browse** (...) button to name the file and select the location of the exported file. Then enter the name of the text file using the keyboard at the bottom of the screen. Choose a folder and location in which to store the text file, then press **Ok**. The text file's location and name display in the ***Target text file*** entry box.
- Append to target file – enable to add points onto an existing file.
- Conversion format – select the conversion format from the drop-down list. These formats have been created using the Format

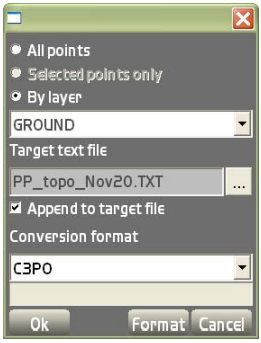


Figure 3-121. Export to Text File

Conversion Formats

To create, edit, or delete a conversion format, press **Format** on the ***export to text file*** dialog box (Figure 3-121 on page 3-81). The ***Conversion formats*** dialog box displays (Figure 3-122). See "Conversion Formats" on page 3-74 for further details on the following parameters and dialog boxes.

- **New** – press to enter a conversion format and it's respective information. The ***conversion formats parameters*** dialog box displays to create a new conversion format.
- **Edit** – press to edit the selected format. The ***conversion formats parameters*** dialog box (Figure 3-122) displays to enter or select conversion parameters.
- **Delete** – press to remove the selected format.

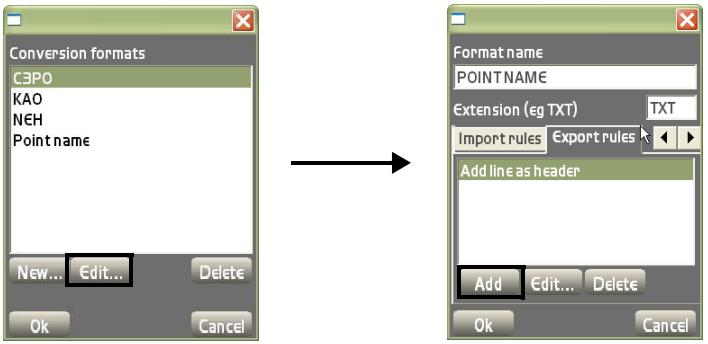


Figure 3-122. Conversion Formats/Conversion Formats Parameters Dialog Box

The Export rules tab on the ***conversion formats parameters*** dialog box (Figure 3-122) adds, edits, or deletes export rules for the selected conversion format.

- **Add** – on the ***Export rules*** tab (Figure 3-122), press **Add** to add an export rule and it's respective information (Figure 3-123 on page 3-83), then press **Ok** to save the information.
  - Rule: Reassign null pt numbers.
  - Pt. Num: enter the starting number to assign to the points with null numbers.

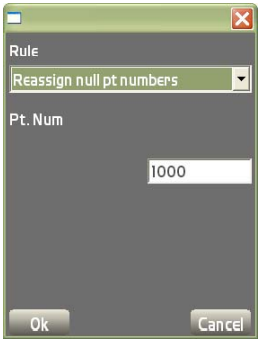


Figure 3-123. Add Export Rule

- **Edit** – on the ***Export rules*** tab, press **Edit** to edit the selected export rule. See the "Add" bullet and Figure 3-122 on page 3-82 for details.
- **Delete** – on the ***Export rules*** tab, press **Delete** to remove the selected export rule.

To PT3 file To export Topcon Points (PT3) to a point file, tap **Data ▸ Points ▸ Import/Export ▸ To PT3 file**. The ***export to text file*** dialog box displays (Figure 3-124 on page 3-84). Unless otherwise selected, the default folder for exported point files will be the "My Documents" folder on the controller.

- All points – enable to export all of the points within the Points file.
- Selected points only – with the desired points selected, enable to export only those points to a text file.
- By layer – enable to export all of the points within a selected layer.
- Target text file – press the **browse** (...) button to name the file and select the location of the exported file. Then enter the name of the text file using the keyboard at the bottom of the screen.
- Append to target file – enable to add points onto an existing file.

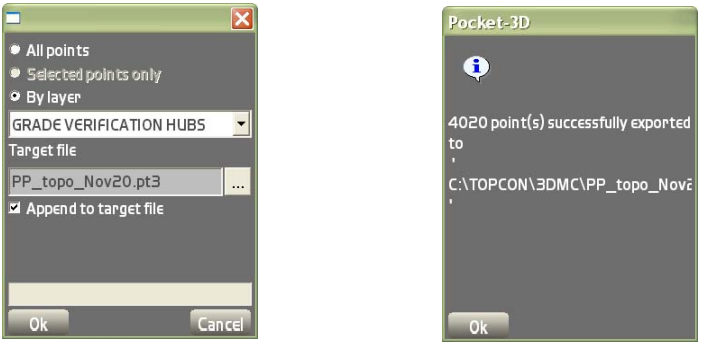


Figure 3-124. Export Topcon Points to a Point File

- Choose a folder and location in which to store the text file, then press **Ok**.

  The confirmation dialog box displays that the export operation was a success.The text file's location and name display in the ***Target text file*** entry box (Figure 3-124).

Calculation Wizard

To perform calculations, tap **Data** ▸ **Calc wizard** (Figure 3-125). The following sections describe the types of calculation possible with Pocket-3D.

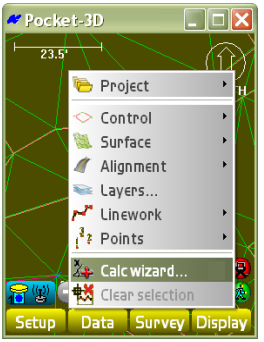


Figure 3-125. Calc Wizard Menu Options

Inverse Between Two Points

On the ***Calculation type*** dialog box, select ***Inverse between two pts*** to calculate the inverse of the direction and distance between two points, then press **Next** (Figure 3-126).

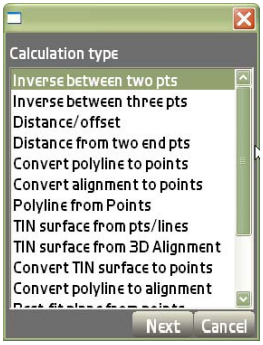


Figure 3-126. Calculation Type – Inverse Between Two Points

The ***results*** dialog box (Figure 3-127 on page 3-86) displays the distance between selected points and the following calculation: ***Horizontal Distance (Horiz. dist.), Slope Distance (Slope dist.), Azimuth, Gradient, Delta X, Delta Y,*** and ***Delta Z***.

- **From Point** – press to select the beginning point on the ***From/To points selection*** dialog box.
- **To Point** – press to select the end point on the ***From/To points selection*** dialog box.
- **Inverse arrows** – press to calculate the return (inverse) between the selected points.
- Press **Back** to return to the ***Calculation type*** dialog box (Figure 3-126) or **Cancel** to return to the main view screen.

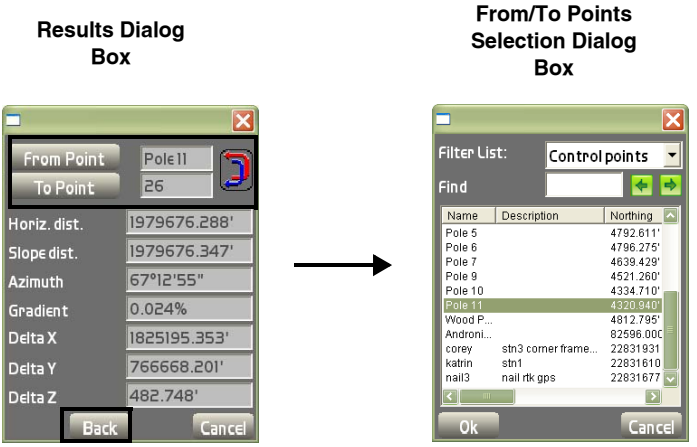


Figure 3-127. Inverse Between Two Points

Inverse Between Three Points

On the ***Calculation type*** dialog box (Figure 3-128), select ***Inverse between three pts*** to calculate the inverse of the direction and distance between three points, then press **Next** (Figure 3-128).

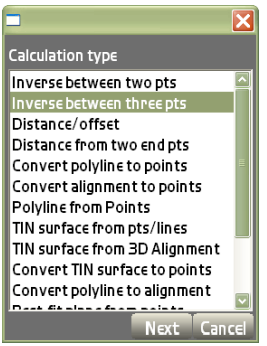


Figure 3-128. Calculation Type – Distance Between Three Points

The ***results*** dialog box displays the distance between selected points and another point and the following calculation for Point 1 or Point 2: ***Horizontal Distance (Horiz. dist), Slope Distance (Slope dist.),*** and ***Azimuth*** (Figure 3-129 on page 3-87).

- **From Point 1** – press to select the beginning point.

- **From Point 2** – press to select the beginning point.
- **To Point** – press to select the return (inverse) between either Point 1 or Point 2 and the selected point.

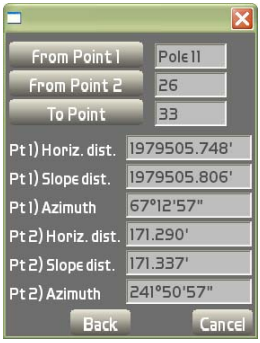


Figure 3-129. Inverse Between Three Points

Distance/Offset

On the ***Calculation type*** dialog box, select ***Distance/offset***, then press **Next** (Figure 3-130).

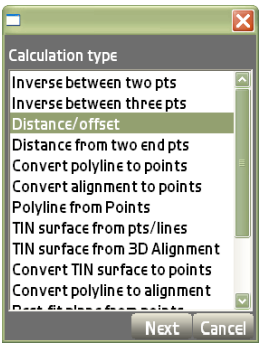


Figure 3-130. Calculation Type – Distance/Offset

This process creates a point in relation to a baseline created from two points (and only two points) selected on the main screen. When finished, you will be able to stake the new point.

On the ***create point*** dialog box, enter or select the following parameters for the point, then press **Next** (Figure 3-131 on page 3-88).

- **From Point** – press to select the point from which to begin.
- **To Point** – press to select the point from which to end.
- Length P1-P2 – displays the length between the two selected points.
- Azimuth Pl-P2 – displays the azimuth from point 1 to point 2 (0° being at the top of the screen).
- Distance from P1 – enter the distance desired for the offset beyond point 1, then press **Ok**.
- Distance beyond P2 – enter the distance desired for the offset beyond point 2, then press **Ok**
- Offset from line P1-P2 – enter the offset distance desired from the line created from Point 1 to Point 2, then press **Ok**.

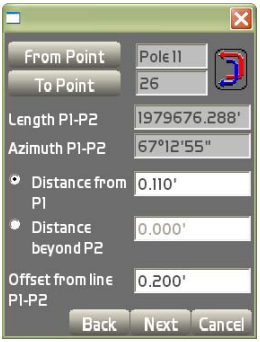


Figure 3-131. Create Point Dialog Box

The view screen displays the baseline created from the two points and the newly created point (Figure 3-132).

- Press the +/- buttons to zoom in or out on the image, or press down on the screen and drag the image around.
- Press **Next** to continue.

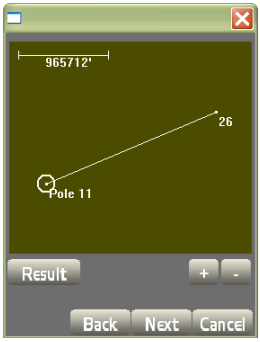


Figure 3-132. View Screen with Baseline

On the point properties dialog box (Figure 3-133), enter the following parameters for the point, then press **Finish**.

- Pt. number – enter the point number.
- Pt. descriptor – enter the point description (if preferred).
- Add to layer – stores the point to the selected layer.

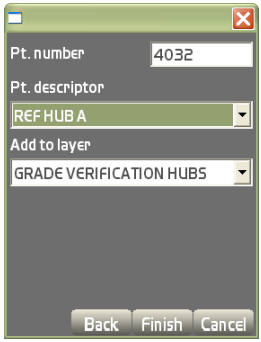


Figure 3-133. Point Properties

Distance From Two End Pts

On the ***Calculation type*** dialog box (Figure 3-134 on page 3-90), select ***Distance from two end pts*** to calculate the distance from two end points, then press **Next** (Figure 3-135 on page 3-91).

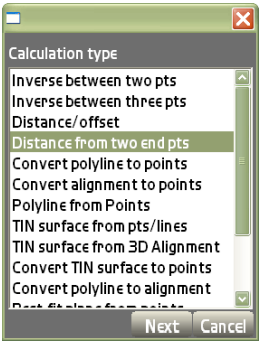


Figure 3-134. Calculation Type Dialog Box – Distance From Two End Points

The ***results*** dialog box displays a new point created from the points selected in the ***Distance From P1*** and ***Distance From P2*** entry boxes (Figure 3-135 on page 3-91).

- **From Point 1** – press to select a point on the ***From/To points selection*** dialog box.
- **From Point 2** – press to select a point on the ***From/To points selection*** dialog box.
- Distance From – enter the intersecting distance from which a new point will be created from Point 1.
- Distance From – enter the intersecting distance from which a new point will be created from Point 2.

Press **Back** to return to the ***Calculation type*** dialog box or **Cancel** to return to the main view screen.

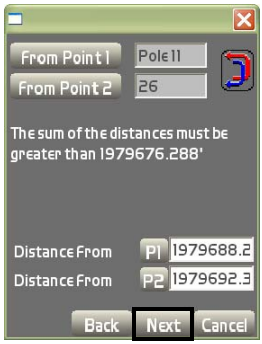


Figure 3-135. Distance From Two End Points

The view screen displays the two original points and specified distance between the two points created in the ***Distance From*** fields (Figure 3-136 on page 3-92).

- Press the **Result** button to display the list of points (Figure 3-136 on page 3-92).
- Select the point you want to create and press **Ok**. The point that is created displays on the main screen in a circle (Figure 3-136 on page 3-92).
- Press the +/- buttons to zoom in or out on the image, or press down on the screen and drag the image around.
- Press **Next** to continue.

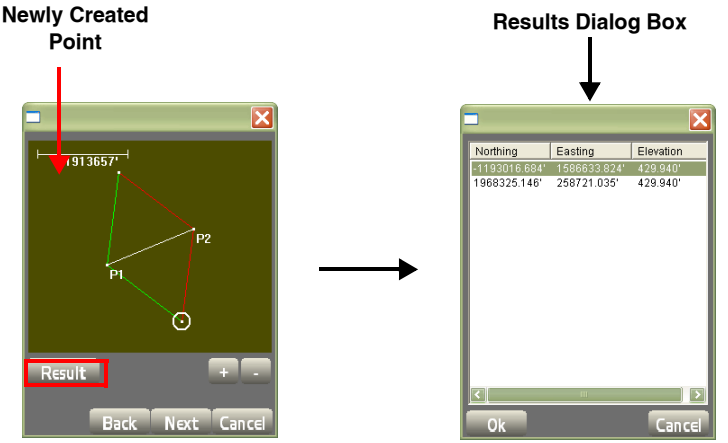


Figure 3-136. View Screen

On the point properties dialog box (Figure 3-137), enter the following parameters for the point, then press **Finish** to return to the main screen.

- Pt. number – enter the point number.
- Pt. descriptor – enter a description for the point.
- Add to layer – stores the point to the selected layer.

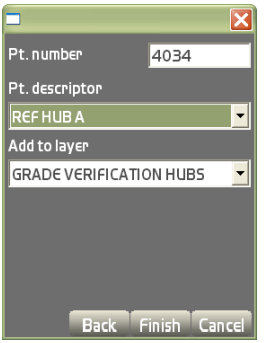


Figure 3-137. Point Properties

Convert Polyline to Points

On the ***Calculation type*** dialog box (Figure 3-138), select ***Convert polyline to points***, then press **Next**.

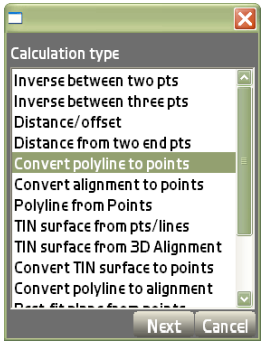


Figure 3-138. Calculation Type – Convert Polyline to Points

This process creates points at all nodes and vertices of a selected polyline. A points file must be open.
On the ***create points*** dialog box (Figure 3-139), enter the following parameters to create points, then press **Next**.

- Create pts at vertices – enable to create points at vertices.
- Create pts at interval – enable to create points at an interval along the polyline; enter the value of the desired interval.

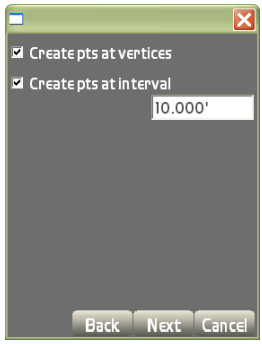


Figure 3-139. Create Points

The view screen displays the coordinate points created from the selected polyline (Figure 3-140 on page 3-94).

- Press the +/- buttons to zoom in or out on the image, or press down on the screen and drag the image around.
- Press **Points** to continue.

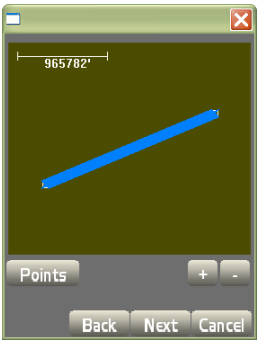


Figure 3-140. View Screen with Coordinate Points Created from Polyline

The ***points*** dialog box displays the ***Northing, Easting,*** and ***Elevation*** parameters of the newly created point(s) (Figure 3-141).
Press **Ok**, then press **Next**.

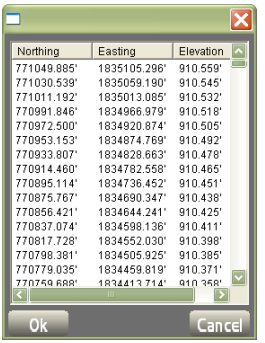


Figure 3-141. Points

On the point properties dialog box (Figure 3-142 on page 3-95), enter the following parameters for the points, then press **Finish**.

- Pt. number – enter the point number.
- Pt. descriptor – enter the point description (if preferred).
- Add to layer – stores the point to the selected layer.

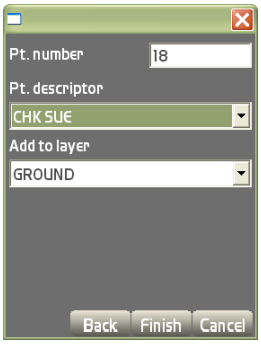


Figure 3-142. Point Properties

Convert Alignment to Points

On the ***Calculation type*** dialog box, select ***Convert alignment to points***, then press **Next** (Figure 3-143).

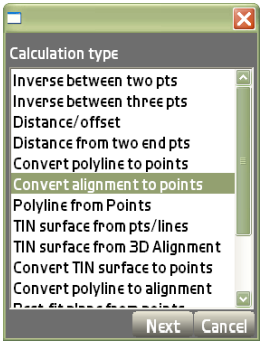


Figure 3-143. Calculation TYpe – Convert Alignments to Points

This process creates coordinate points at all nodes and vertices of a selected alignment. A points file must be open and an alignment selected from the list of user-created RD3 files.

On the ***create points*** dialog box (Figure 3-144 on page 3-96), enter the following parameters to create the points, then press **Next**.

- Alignment – select an alignment to be converted to points from the drop-down list.

- Start station – the start station of the selected alignment (created using Data ▸ Alignment). To select a different start station, enter the desired start station.
- End station – the end station of the selected alignment (created using Data ▸ Alignment). To select a different end station, enter the desired end station.
- at Interval – the station interval of the selected alignment (created using Data ▸ Alignment). Enable to select a different station interval.
- @ Transition points – known transitions in the alignment.
- Feature – select the feature to be converted from the drop-down list.
- Extra H.Offset – enter a horizontal offset for the alignment (if preferred).
- Extra V.Offset – enter a vertical offset for the alignment (if preferred).

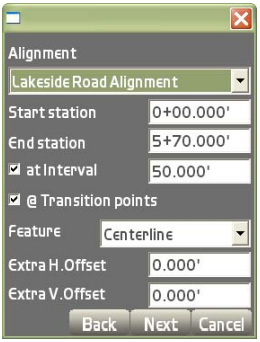


Figure 3-144. Create Points Dialog Box

The view screen will display the coordinate points created from the selected alignment (Figure 3-145 on page 3-97).

1. Press the **+/-** buttons to zoom in or out on the image, or press down on the screen and drag the image around.
2. Press **Next** to continue.

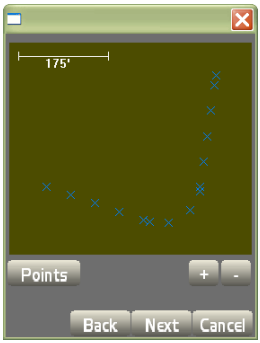


Figure 3-145. Convert Alignment to Points Preview

3. On the review screen (Figure 3-145), press **Points**. The ***Points*** dialog box displays (Figure 3-146).

   The ***points*** dialog box displays the ***Northing***, ***Easting***, and ***Elevation*** of the newly created point(s) (Figure 3-146).

4. Press **Ok** to continue.

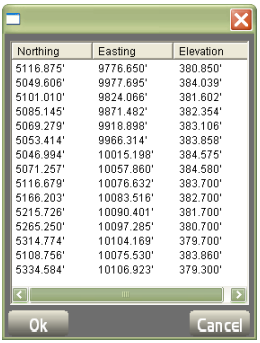


Figure 3-146. Converted Points

5. On the ***point properties*** dialog box (Figure 3-147 on page 3-98), enter the following parameters for the points, then press **Finish**.
   - Pt. number – enter the point number.
   - Pt. descriptor – enter the point description (if preferred).
   - Add to layer – stores the point to the selected layer.

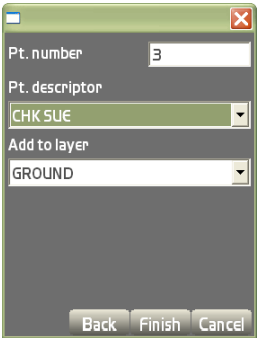


Figure 3-147. Point Properties

Polyline From Points

On the ***Calculation type*** dialog box, select ***Polyline from points***, then press **Next** (Figure 3-148).

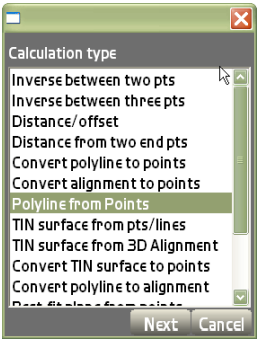


Figure 3-148. Calculation Type – Polyline From Points

This process creates a polyline from the points selected on the main screen.

The view screen displays the polyline created from the selected points (Figure 3-149 on page 3-99). Press the +/- buttons to zoom in or out on the image or press down on the screen to drag the image round. Press **Next** to continue.

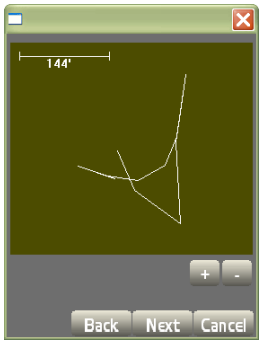


Figure 3-149. Polyline From Points

On the ***polyline properties*** dialog box (Figure 3-150), do the following, then press **Finish**.

- Add to layer – select a layer to add from the drop-down box.
- Close Polyline – check mark this box to close the polyline.

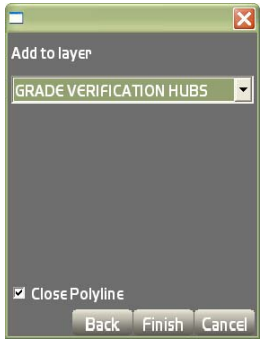


Figure 3-150. Polyline Properties Dialog Box

TIN Surface from Points/Lines

On the ***Calculation type*** dialog box, select ***TIN surface from pts/lines***, then press **Next** (Figure 3-151).

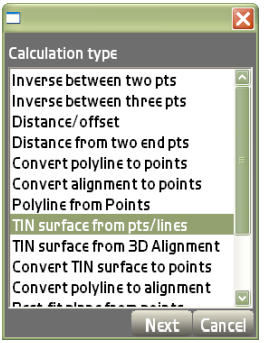


Figure 3-151. Calculation Type – TIN Surface From Points/Lines

This process creates a TN3 file from selected points and/or lines on the main screen.
The view screen will display the TIN surface created from the selected points and/or lines (Figure 3-152 on page 3-101).

1. Press the **+/-** buttons to zoom in or out on the image, or press down on the screen and drag the image around.
2. Press **Next** to continue. The ***surface properties*** dialog box displays (Figure 3-152 on page 3-101).
3. On the ***surface properties*** dialog box (Figure 3-152), enter the following parameters for the surface, then press **Finish**.
    - Name for TIN surface – enter a name for the TIN surface on the alpha-numeric pop-up keyboard.

- Set as current surface – enable to set the surface as the current surface.

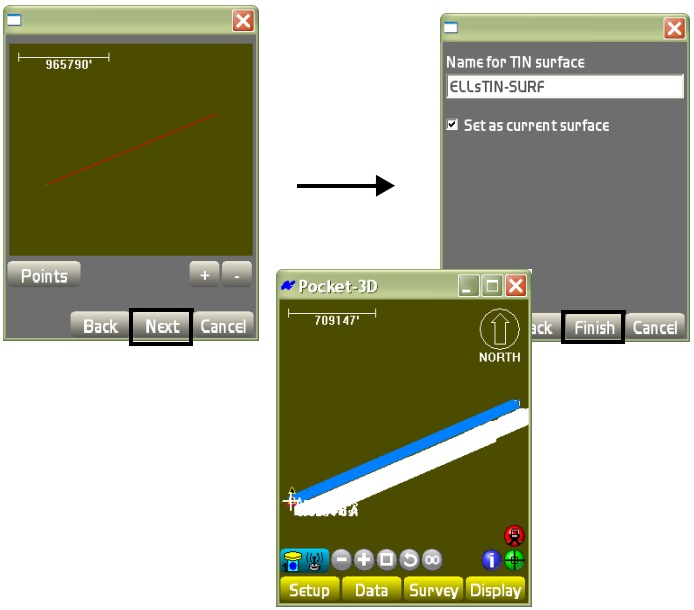


Figure 3-152. View Screen for TIN Surface

TIN Surface From 3D Alignment

On the ***Calculation type*** dialog box (Figure 3-153), select ***TIN Surface From 3D Alignment***, then press **Next.**

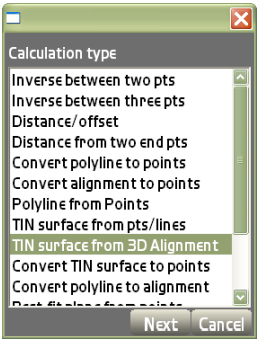


Figure 3-153. TIN Surface From 3D Alignment

On the ***3D alignment points generation*** dialog box (Figure 3-154), select from one of the following and press **Next**:

- Generate points using regular sampling interval – enable this option to create points along the Centerline at a distance of every x number of feet, where "x" is the interval.
  - Sampling interval (along CL): enter a value for the interval at which to create the points along the centerline.
- Generate points using only where necessary – enable this option to create points on locations where the centerline changes it directions.
  - Max arch/chord separation: for curves/arcs, you can choose a max/chords separation. This is the maximum distance of the curve from the line (connection of two neighboring points).

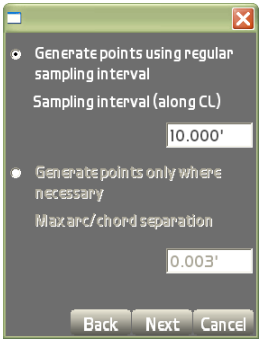


Figure 3-154. Create Points Dialog Box

The ***view screen*** displays (Figure 3-155 on page 3-103) the TIN surface created from the 3D alignment. Press the +/- buttons to zoom in or out on the image or press down on the screen to drag the image around. Press **Next** to continue.

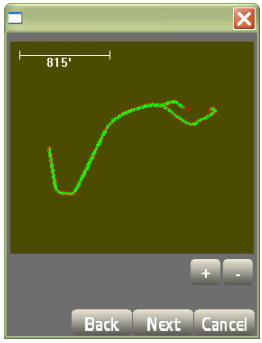


Figure 3-155. View Screen – TIN Surface Created From 3D Alignment

On the ***TIN surface properties*** dialog box (Figure 3-156), enter a name for the TIN surface and check mark the ***Set as current surface box*** to set the surface as the current surface.

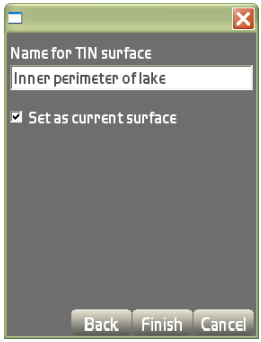


Figure 3-156. TIN Surface Properties Dialog Box

Convert TIN Surface to Points

On the ***Calculation type*** dialog box (Figure 3-157), do the following:

- Select ***Convert TIN surface to points***, then press **Next.**

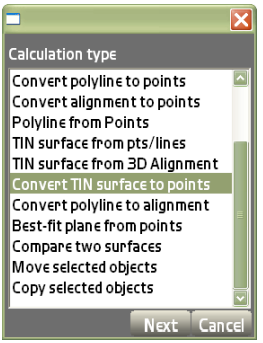


Figure 3-157. Calc Wizard – Convert TIN Surface to Points

This process converts a TIN surface to points from the current TIN surface on the main screen.
The view screen (Figure 3-158) displays the points created from the recently converted TIN surface.

- Press the +/- buttons to zoom in or out on the image or press down on the screen to drag the image around.
- Press **Next** to save and return to the main screen.

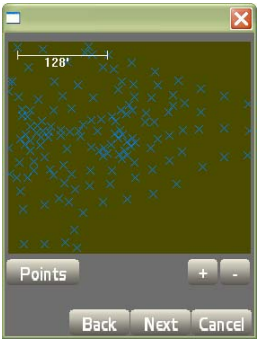


Figure 3-158. View Screen – TIN Surface Converted to Points

On the point properties dialog box (Figure 3-159), enter the following parameters for the point, then press **Finish**.

- Pt. number – enter the point number.
- Pt. descriptor – select a point descriptor from the drop-down box.
- Add to layer – choose the layer from the list in which you want to store the point.

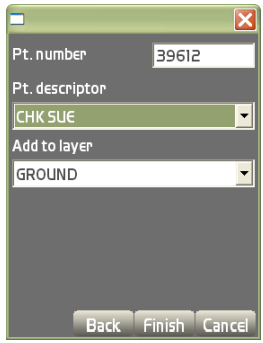


Figure 3-159. Point Properties

Convert Polyline to Alignment

On the ***Calculation type*** dialog box (Figure 3-160), select ***Convert polyline to alignment***, then press **Next**.

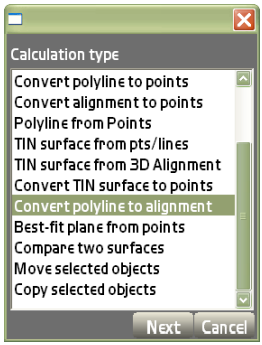


Figure 3-160. Calculation Type – Convert Polylines to Alignment

This process creates an RD3 file from a polyline selected on the main screen.

The view screen will display the alignment created from the selected polyline (Figure 3-161).

1. Press the **+/-** buttons to zoom in or out on the image, or press down on the screen and drag the image around.
2. Press **Next** to continue.

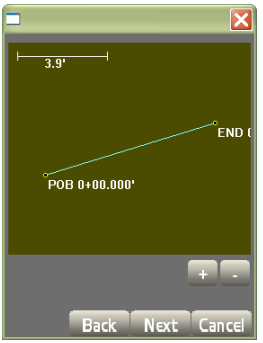


Figure 3-161. View Screen for Polyline to Alignment Conversion

On the alignment properties dialog box (Figure 3-162), enter the following parameters for the alignment, then press **Finish**.

- Name for alignment – enter a name for the alignment.
- Set as current alignment – enable to set the alignment as the current alignment.

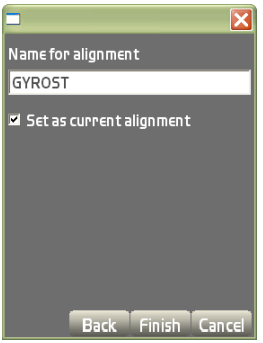


Figure 3-162. Alignment Properties Dialog Box

Best-fit Plane from Points

On the ***Calculation type*** dialog box, select ***Best-fit plane from points***, then press **Next** (Figure 3-163).

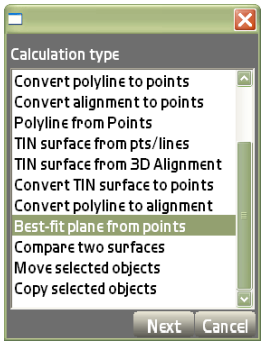


Figure 3-163. Calculation Type – Best-fit Plane From Points

This process creates a dual-slope plane to balance the cut/fill values across the entire area of interest.
The view screen will display the dual-slope plane created from the selected polyline (Figure 3-164).

1. Press the +/- buttons to zoom in or out on the image, or press down on the screen and drag the image around.
2. Press **Next** to continue.

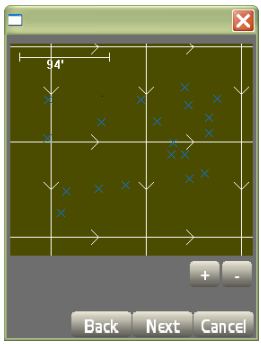


Figure 3-164. View Screen for Polyline to Alignment Conversion

On the plane surface properties dialog box (Figure 3-165), enter the following parameters for the Plane surface, the press **Finish**:

- Name for Plane surface – enter a name for the Plane surface.
- Grid interval – enter the grid interval parameter.
- Grid orientation – enter a parameter for the grid orientation.
- Slope east – enter the slope parameter to the east.
- Slope north – enter the slope parameter to the north.
- Set as current surface – enable to set the surface as the current surface.

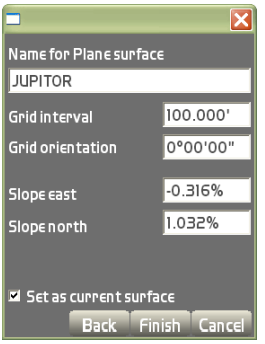


Figure 3-165. Plane Surface Properties Dialog Box

Compare Two Surfaces

On the ***Calculation type*** dialog box (Figure 3-166), select ***Compare two surfaces***, then press **Next**.

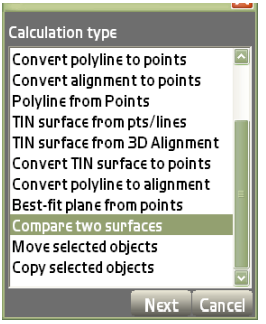


Figure 3-166. Calculation Type – Compare Two Surfaces

On the ***compare surfaces*** dialog box (Figure 3-167), select the surfaces to be compared, then press **Next**.

- Design Surface – choose a surface from the drop-down list.
- Existing Surface – choose a surface from the drop-down list. Remember to choose two over-lapping surfaces.

Figure 3-167. Compare Surface Parameters

The **view screen** displays the surface created from the comparison of the two selected surfaces (Figure 3-168).

1. Press report to display the ***report*** dialog box (Figure 3-169 on page 3-110).
2. Press the +/- buttons to zoom in or out on the image, or press down on the screen and drag the image around.

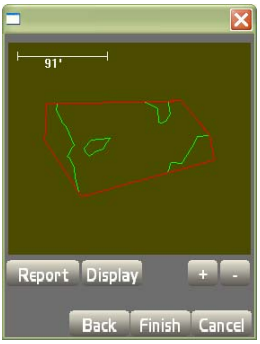


Figure 3-168. View Screen for Comparing Two Surfaces

The report dialog box (Figure 3-169) displays the following results: ***Date, Name of Design Surface, Name of Existing Surface, Common Area, Cut Volume, Fill Volume,*** and ***Volume difference***.

1. Press **Save** to save this information.
2. Enter a name for the text file using the keyboard at the bottom of the screen.
3. Select a folder and location in which to store the text file, then press **Ok** to return to the **view screen** (Figure 3-168 on page 3-109).

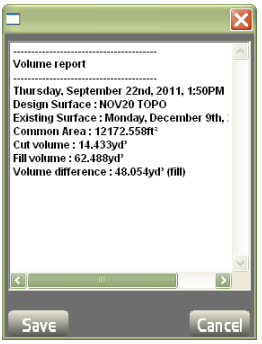


Figure 3-169. Report Dialog Box

4. Press **Display** to select surface parameters (Figure 3-168 on page 3-109).

On the display surface dialog box (Figure 3-170 on page 3-111), select the desired parameters for the surface display, then press **Ok**.

- Show contours – enable to display the contour lines at a set interval on the surface.
- Show solid colors – enable to display solid colors at a set interval on the surface.
- Interval – enter the desired contour interval.
- Show grid of cut/fills – enable to display a grid of cuts/fills on the surface.

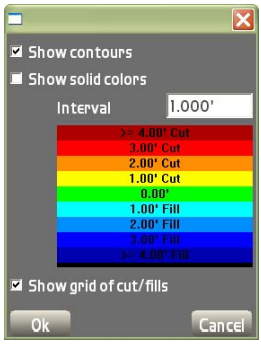


Figure 3-170. Surface Display Dialog Box

Move Selected Objects

On the ***Calculation type*** dialog box, select ***Move selected objects***, then press **Next** (Figure 3-171). This process moves all selected objects by a linear distance and can also rotate them around a specific point.

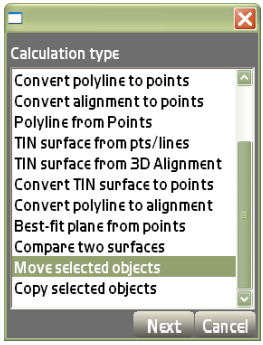


Figure 3-171. Move Selected Objects

On the ***align selected objects*** dialog box (Figure 3-172 on page 3-112), do the following:

- Align selected objects – define a vector/distance and direction by what you want to move your objects to:

– Move **P1** to **P2**: ***P1*** is the “From” location and ***P2*** is the “To” location.

Pocket-3D calculates the dN and dE values automatically.

NOTE: Alternatively, you can manually enter a direction value for Delta North (dN/Delta East (dE), if you know by how much you want to move/align your objects with to the north/east.

– dN/dE: enter delta North (***dN***) and delta East (***dE***) values manually if you know by how much you want to move your objects to the north/east.

– Align/with: to rotate your objects as well, you can choose to calculate a rotation angle by how much those objects will be rotated. Use ***P3*** as the “From” and ***P4*** as the “To” for calculation.

– Move: check mark this box to move and rotate a copy of the current selected items, even save it to another layer.

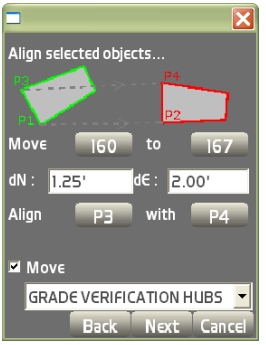


Figure 3-172. Move Selected Objects Dialog Box

The view screen (Figure 3-173 on page 3-113) shows the current location in green and the new location in red after the move.

1. Press the +/- (**Plus/Minus**) buttons to zoom in or out on the image, or press down on the screen and drag the image around.
2. Press **Next** to save and return to the main screen.

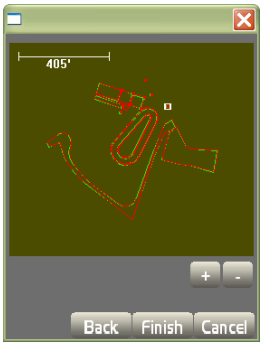


Figure 3-173. Move Selected Objects – Results Screen

Copy Selected Objects

On the ***Calculation type*** dialog box, select ***Copy selected objects***, then press **Next (**Figure 3-174**)**.

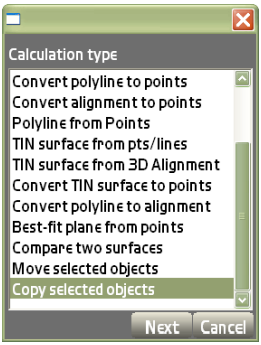


Figure 3-174. Calculation Type – Copy Selected Objects

On the ***copy selected objects*** dialog box (Figure 3-175 on page 3-114), do the following:

- **Copy selected objects and move by..** – to define a vector/ distance and direction by what you want to move your objects to:
  - Move **P1** to **P2**: ***P1*** is the "From" location and ***P2*** is the "To" location.

  Pocket-3D calculates the dN and dE values automatically.

NOTE: Alternatively, you can manually enter a direction value for delta North (dN) / delta East (dE), if you know by how much you want to move your objects to the north/east.

– dN/dE: enter delta North (***dN***) and delta East (***dE***) values manually if you know by how much you want to move your objects to the north/east.

– Align/With: to rotate your objects as well, you can choose to calculate a rotation angle by how much those objects will be rotated. Use ***P3*** as the "From" and ***P4*** as the "To" for calculation.

– Copy to: check mark this box to move and rotate a copy of the current selected items, even save it to another layer.

This creates a copy of the selected items. Please see "Move Selected Objects" on page 3-111 to get detailed information about the move and rotate instructions.

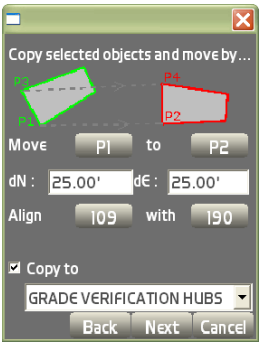


Figure 3-175. Copy Selected Objects

The view screen (Figure 3-176 on page 3-115) shows the current location in green and the new location in red after the move.

- Press the +/- (**Plus/Minus**) buttons to zoom in or out on the image, or press down on the screen and drag the image around.
- Press **Finish** to accept the copied object(s).

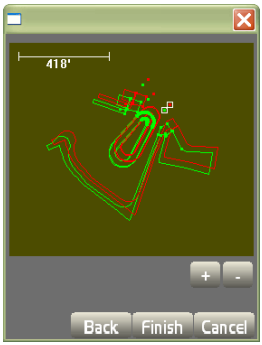


Figure 3-176. Copy Selected Objects – Results Screen

Clear Selection

To deselect any selected data (points or lines), tap **Data ▸ Clear selection** (Figure 3-177).

Figure 3-177. Clear Selected Features

Notes:

Survey Menu

Depending on the application (GPS or Total Station), the Survey menu contains different options for surveying and staking out points.

GPS Survey Applications

For GPS applications, the Survey menu (Figure 4-1) has the following menu items:

- Connect to GPS/Disconnect from GPS
- Measure pts
- Auto-topo/Stop auto-topo
- Stake-out

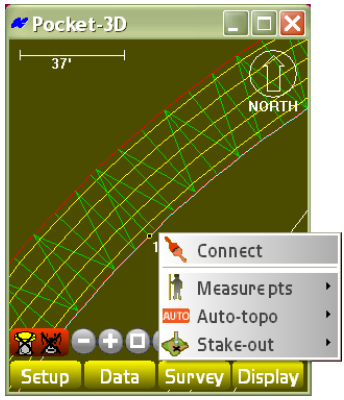


Figure 4-1. Survey Menu

Connect to GPS/Disconnect from GPS

To enable or disable the connection with a GPS+ system, tap **Survey ▸ Connect to GPS/Disconnect from GPS** (Figure 4-2).

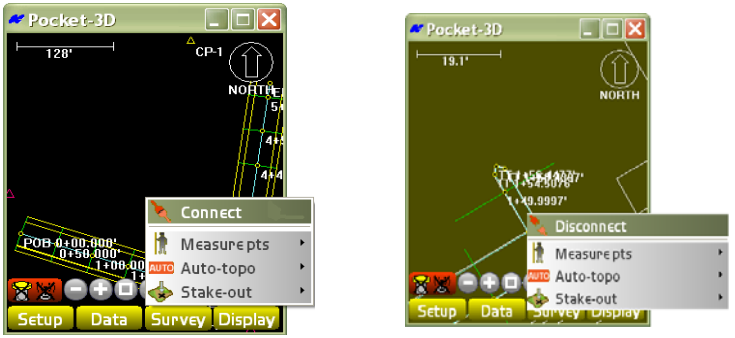


Figure 4-2. Connect to GPS/Disconnect from GPS

Measure Points

The Measure pts menu (Figure 4-3) collects points, control points (mmGPS transmitter locations), points with offsets, a reference line, and polylines in the field.

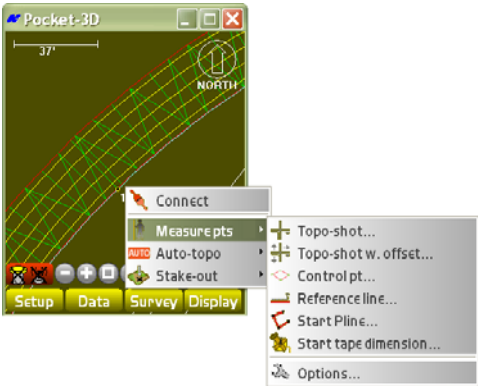


Figure 4-3. Measure Points Survey Menu Options

Topo-shot

To collect a topo-shot, tap **Survey ▸ Measure pts ▸ Topo-shot** (Figure 4-4).

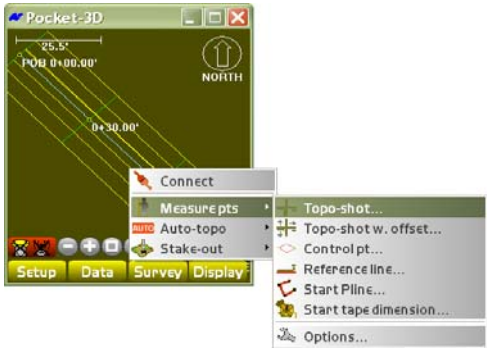


Figure 4-4. TopoShot

On the ***Topo-shot*** dialog box, select the desired parameters for the topo-shot point, then press **Ok (**Figure 4-5 on page 4-3).

- Pt. number – enter the point number.
- Pt. descriptor – enter the point description (if preferred).
- Add to layer – stores measured points to the selected layer
- Antenna Height – enter the desired antenna height
- Measured to – select either ***Base*** or ***Rim*** from the drop-down box.

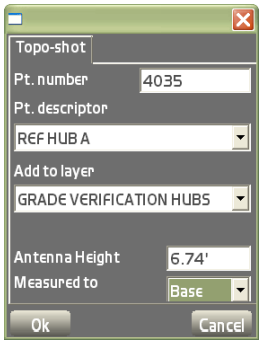


Figure 4-5. Measure Topo-shot

Topo-shot With Offset

To collect a topo-shot with offset, tap **Survey** ▸ **Measure pts** ▸ **Topo-shot w. offset** (Figure 4-6).

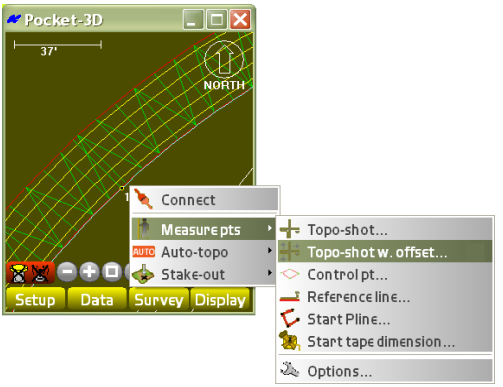


Figure 4-6. Collect a Topo Shot with Offset

Enter the desired topo-shot parameters. For details on the ***Topo-shot*** tab, see "Topo-shot" on page 4-3.

On the ***Offset*** tab, enter actual location where the collected shot is located, then press **Ok** (Figure 4-7**)**.

- measurement 2) – enter an offset value ***Above the*** topo shot. Select the location of this measurement (above).

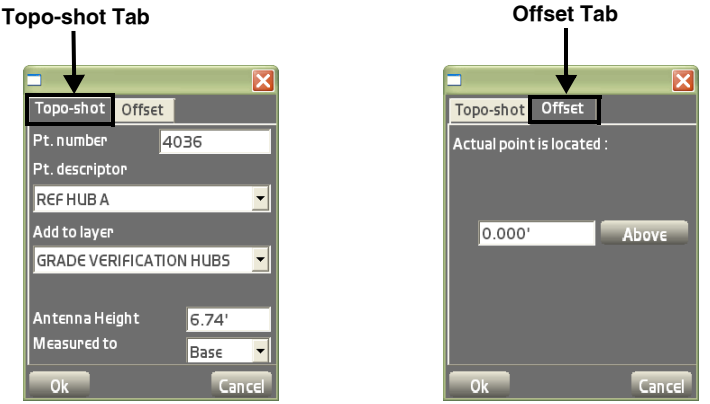


Figure 4-7. Measure Topo-shot with Offset

Control Point

To measure a point that can be used as a mmGPS transmitter location point, tap **Survey ▸ Measure pts ▸ Control pt (**Figure 4-8**)**.

NOTICE

The measure control points option is used to add mmGPS transmitter location points. Do not use for extending localization.

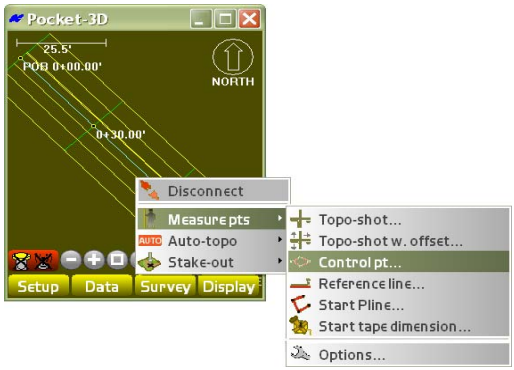


Figure 4-8. Measure a Control Point

On the ***control pt*** dialog box (Figure 4-9 on page 4-6), enter the following information, then press **start** to measure ***Coords/GPS*** coordinates.

- Name – enter a name for the control point.
- Description – enter the point description (if preferred).

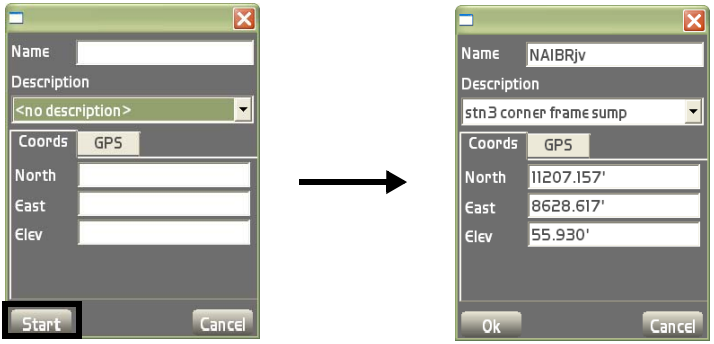


Figure 4-9. Survey ▸ Measure pts ▸ Control pt

Reference Line

When measuring a reference line, first select a polyline, alignment, or points. Then press and hold the selection on the main screen and select Points, "Use as ref. line" on the pop-up menu.

To measure a reference line, tap **Survey ▸ Measure pts ▸ Reference line** (Figure 4-10).

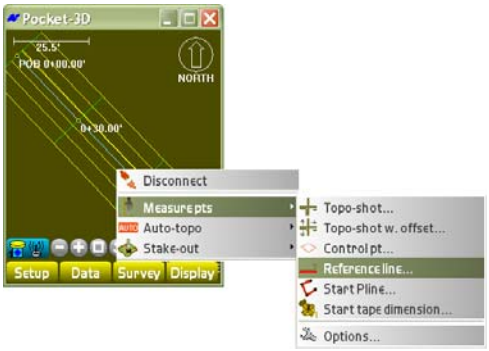


Figure 4-10. Survey Reference Line

On the ***taped distance*** dialog box, select the desired parameters for the taped distance (reference line) (Figure 4-11 on page 4-7), then press **Save**.

- Pt. number – enter the point number.
- Pt. descriptor – enter the point description (if preferred).

- Add to layer – stores measured points to the selected layer.
- New layer – opens the ***New layer*** dialog box in which to create a new layer to save the points to.
- Taped (measured) distances – measure a taped distance using the following parameters:
  - Distance: enter the distance by which to log points on the pop-up keyboard.
  - Offset: enter an offset value from the reference line on the pop-up keyboard.
  - Vertical: enter a vertical distance from the reference line on the pop-up keyboard.

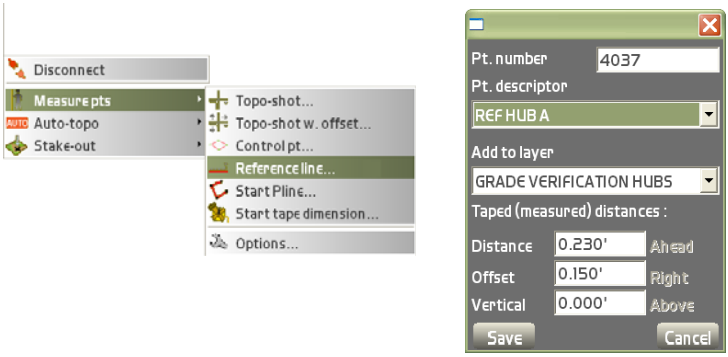


Figure 4-11. Measure Reference Line

Start Polyline

To collect points along a polyline, tap **Survey** ▸ **Measure pts** ▸ **Start Pline** (Figure 4-12).

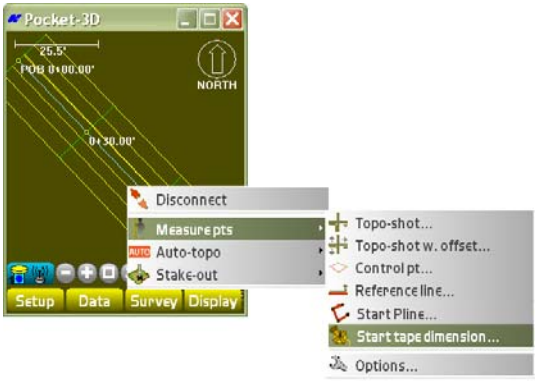


Figure 4-12. Survey ▸ Measure pts ▸ Start polyline

On the ***start polyline*** dialog box (Figure 4-13), select a layer from the ***Add to layer*** drop-down list to create a layer in which to store measured points. Then press **Ok** (Figure 4-13).

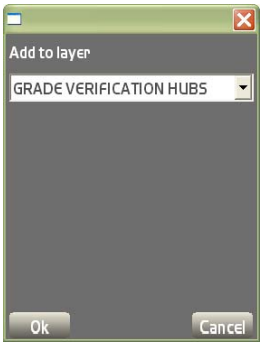


Figure 4-13. Select Layer or Add New Layer

Next Polyline Pt

To collect the next point along a polyline, tap **Survey ▸ Measure pts ▸ Next polyline pt** (Figure 4-14).

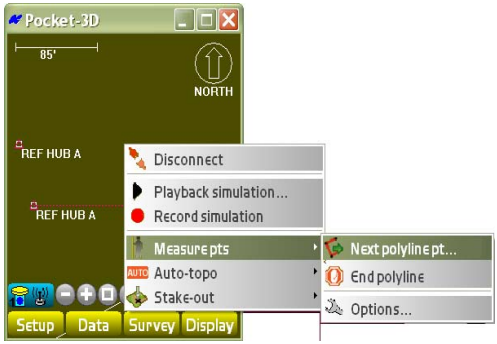


Figure 4-14. Survey ▸ Measure pts ▸ Next polyline pt

End Polyline

To end the polyline, tap **Survey ▸ Measure pts ▸ End polyline** (Figure 4-15).

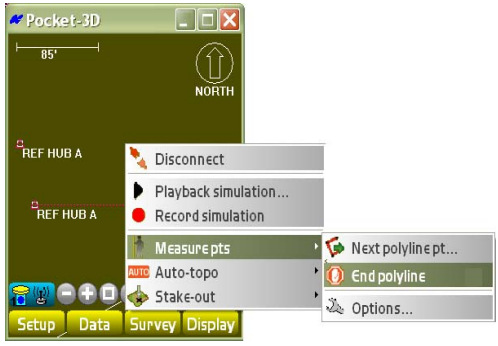


Figure 4-15. End Polyline

Start Tape Dimension

To measure lines perpendicular or at angles to each other, tap **Survey ▸ Measure pts ▸ Start tape dimension** (Figure 4-16).

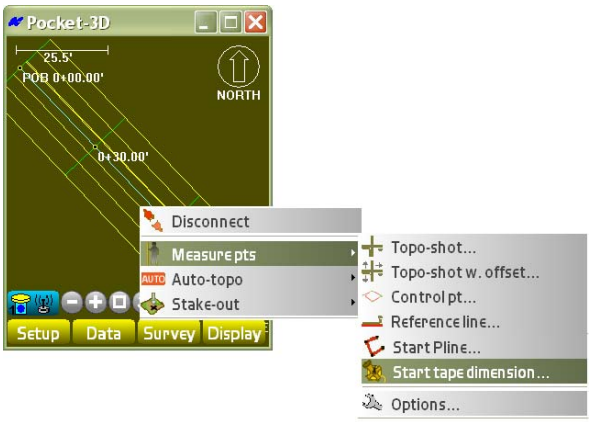


Figure 4-16. Survey ▸ Measure Pts. ▸ Start Tape Dimension

On the ***start tape dimension*** dialog box, enter or select the following information, and press **Ok** (Figure 4-17 on page 4-11).

- Pt. layer – select a layer name from the drop-down list.
- Polyline layer – select a polyline layer from the drop-down list.
- **From Point** – select the beginning of the tape measurement at a known point on the ***points listing*** dialog box.
- **To Point** – select the end of the tape measurement at a known point on the ***points listing*** dialog box.
- Inverse arrows ( ) – press to reverse the **From Point** and **To Point** fields on the ***points listing*** dialog box.
- Use ENT to tape dim. – enable the ENTER key to start the measurement on each taped dimension.
- Draw Polyline – enable to create a polyline.

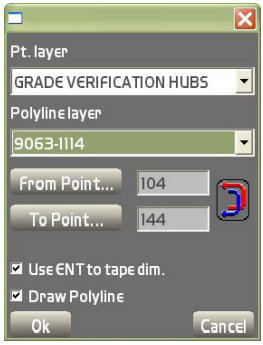


Figure 4-17. Start Tape Dimension Dialog Box

Tape Dimension

To enter parameters for the tape dimension, tap **Survey ▸ Measure pts ▸ Tape dimension** (Figure 4-18).

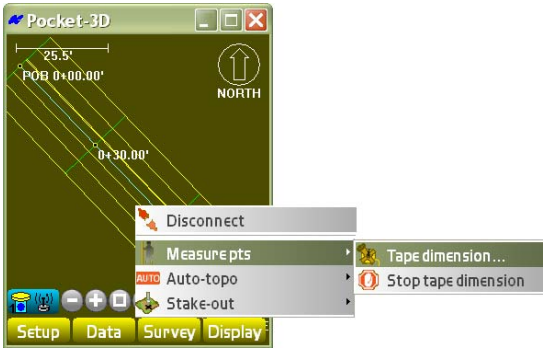


Figure 4-18. Begin a Tape Dimension

On the Tape tab, enter the following information and press **Ok** (Figure 4-19 on page 4-12).

- Pt. number – change or enter the point number.
- Pt. descriptor – change or enter the point description.
- Taped dimension – enter the dimension that will be used to create the new line/point.
  - Length: enter the length of the taped dimension.

  – Right/Left: tap to toggle the entered tape dimension length either to the right or left of the last reference point.

- Use ENT to tape dim. – enable the ENTER key to start the measurement on each taped dimension.
- Start Pline – enable to start the polyline.

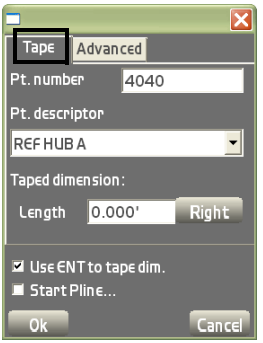


Figure 4-19. Tape Dimension Parameters

On the Advanced tab, select and enter the following information and press **Ok** (Figure 4-20 on page 4-13).

- Distance – enable to enter a distance/offset that makes the next point 90° from the last point.
  – **Right/Left**: tap to toggle the entered tape dimension either to the right or left of the last reference point.
  – Offset: enter the offset either Ahead or Behind the last reference point.
  – **Ahead/Behind**: tap to toggle the entered offset distance either ahead or behind of the last reference point.
- Angle – enable to enter an angle (other than 90°) and length for the next point. A negative distance will make the angle direct towards the left; a positive distance will make the angle direct towards the right.
  – Length: the length of the tape dimension to the next point.
- Vertical – enter the vertical distance.
  – **Above/Below**: tap to toggle the entered vertical distance either above or below the last reference point.

- Use ENT to tape dim. – enable the ENTER key (on the controller's casing below the display screen) to start the measurement on each taped dimension.
- End polyline – enable to end the polyline.

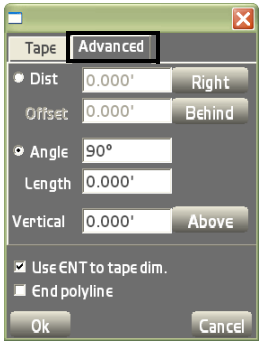


Figure 4-20. Advanced Tab

Stop Tape Dimension

To stop the tape dimension, tap **Survey ▸ Measure pts ▸ Stop tape dimension**.

Options

To view or change options for topo-shot or control point measurements, tap **Survey ▸ Measure pts ▸ Options** (Figure 4-21).

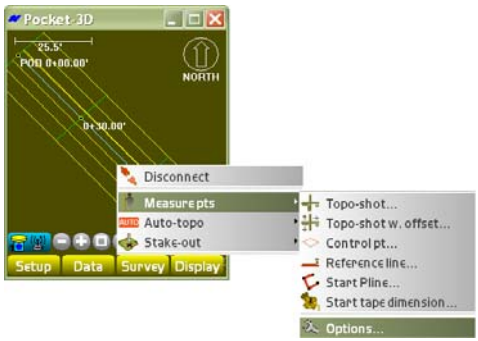


Figure 4-21. Survey ▸ Measure pts ▸ Options

On the Topo-shot tab, select the desired options for topo-shot measurements, then press **Ok (**Figure 4-22 on page 4-15**)**.

- Prompt for pt. details – enable to prompt for point details every time a topo-shot is measured.
  - Before: enable this option to prompt for point details before the topo-shot is measured.
  - After: enable this option to prompt for point details after the topo-shot is measured.
- Minimum requirements – the following options define the minimum requirements for each topo-shot measured.
  - Duration (secs): enter the minimum time in secon45ds desired for each topo-shot.
  - H. Precision: enter the minimum GPS+ horizontal precision desired for each topo-shot.
  - V. Precision: enter the minimum GPS+ vertical precision desired for each topo-shot.
- Press ENTER to measure – enable to use the Enter key on the controller's casing (below the display screen) to start the measurement on each topo-shot.
- Require RTK Initialized – enable to allow measurements in a float/autonomous solution.
- Require mmGPS Signal – allows for only mmGPS+ initialized measurements. If the solution is initialized only (rather than mmGPS initialized), the shot will not be accepted. This option allows measurements in a float/autonomous solution.

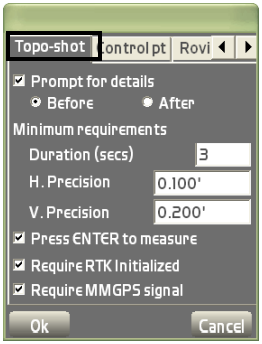


Figure 4-22. Topo-shot Options

On the Control pt tab, select the minimum requirements for control point measurements, then press **Ok** (Figure 4-23).

- Duration (secs) – enter the minimum time in seconds desired for each control point measurement.
- H. Precision – enter the minimum horizontal precision desired for each control point measurement.
- V. Precision – enter the minimum vertical precision desired for each control point measurement.

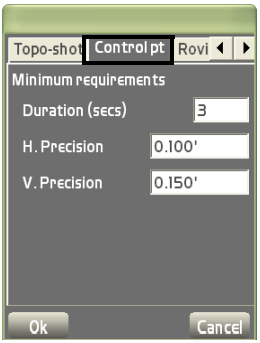


Figure 4-23. Control Point Options

On the Roving tab, enter a roving accuracy limit for the horizontal and vertical RMS value, then press **Ok (**Figure 4-24 on page 4-16).

- H. Precision – enter a limit for the horizontal RMS value.
- V. Precision – enter a limit for the vertical RMS value.

If these values are exceeded, the GPS/mmGPS sensor button will turn orange and flash. Also, no measurement will be taken in auto topo mode if the entered values are over the limit.

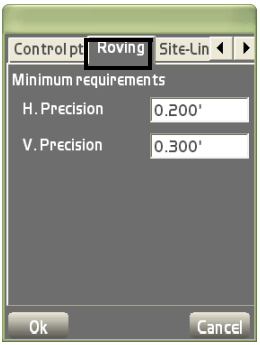


Figure 4-24. Roving Options

On the Site-Link tab, check mark the box below to send a toposhot to a Site-link client (Figure 4-25), then press **Ok**.

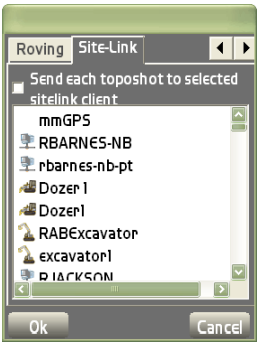


Figure 4-25. Site-Link Options

Auto-topo/Stop Auto-topo

Used in 3D GPS+ applications, the Auto-topo/Stop auto-topo feature in Pocket-3D performs “on the fly” topographic surveys of an entire project, or any portion thereof.

By Distance

To measure points at a set distance, tap **Survey ▸ Auto-topo ▸ By distance** (Figure 4-26).

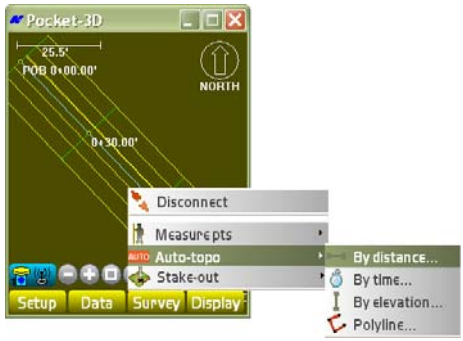


Figure 4-26. Survey ▸ Auto-topo ▸ By distance

On the ***by distance*** dialog box, select the desired parameters, then press **Ok** (Figure 4-27 on page 4-18).

- Min. distance – enter the minimum distance by which to log points.
- Check dist to last point – enable to make sure the desired elevation is traveled before the next measurement is taken. With this option enabled, measurements can be less than or greater than the desired distance.
- Check dist to all points – enable to make sure that no measurements within the jobsite are closer to each other than the desired elevation.
- Add to layer – stores measured points to the selected layer.
- Assign pt. numbers – enable to assign point numbers to measured points.
- Starting from – enter the starting point number for the auto-topo points.

- Pt. descriptor – enter the point description (if preferred).

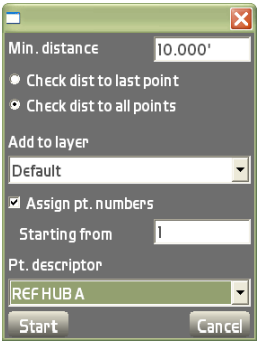


Figure 4-27. Auto-topo Survey – By Distance

- Press **Start** to begin the auto-topo survey.

By Time

To measure points at a constant time interval, tap **Survey ▸ Auto-topo ▸ By time** (Figure 4-28).

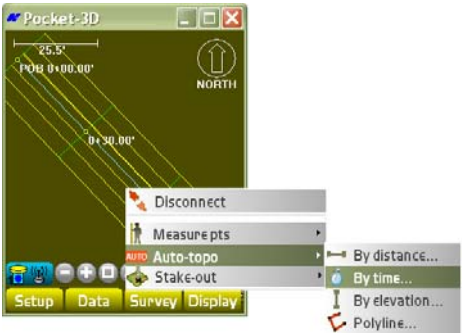


Figure 4-28. Survey ▸ Auto-topo ▸ By time

On the ***by time*** dialog box, select the desired parameters, then press **Ok** (Figure 4-29).

- Time interval (secs) – enter the time interval for logging points.
- Add to layer – stores measured points to the selected layer.
- Assign pt. numbers – enable to assign point numbers to measured points.

- Starting from – enter the starting point number for the auto-topo points.
- Pt. descriptor – enter the point description (if preferred).

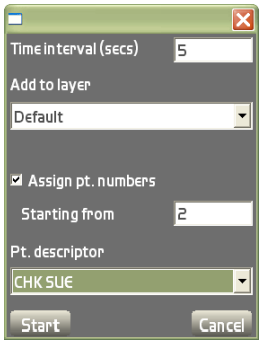


Figure 4-29. Auto-topo Survey – By Time

By Elevation

To measure points at a set elevation, tap **Survey ▸ Auto-topo ▸ By elevation** (Figure 4-30).

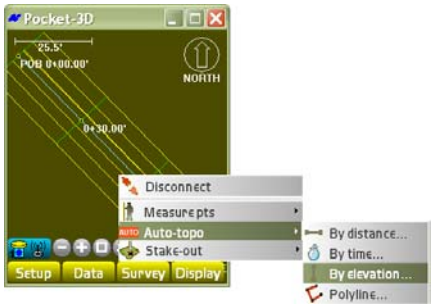


Figure 4-30. Survey ▸ Auto-topo ▸ By Elevation

On the ***by elevation*** dialog box, select the desired parameters, then press **Start** (Figure 4-31 on page 4-20).

- Min. elevation diff. – enter the minimum difference in elevation by which to log points.
- Check elev. to last point – enable to make sure the desired elevation is reached before the next measurement is taken. With

this option enabled, measurements can be lower than or higher than the entered elevation difference.

- Check elev. to closest point – enable to make sure that no measurements within the jobsite are closer to each other than the entered elevation difference.
- Add to layer – stores measured points to the selected layer.
- Assign pt. numbers – enable to assign point numbers to measured points.
- Starting from – enter the starting point number with which to begin measuring auto-topo points.
- Pt. descriptor – enter the point description (if preferred).

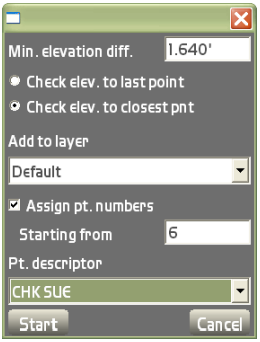


Figure 4-31. Auto-topo Survey – By Elevation

Polyline

To measure points at a set distance along a polyline, tap **Survey** ▸ **Auto-topo** ▸ **Polyline** (Figure 4-32).

Figure 4-32. Survey ▸ Auto-topo ▸ Polyline

On the ***Polyline*** dialog box, select the desired parameters, then press **Ok** (Figure 4-33).

- Min. distance – enter the minimum distance for logging points.
- Add to layer – stores measured points to the selected layer.

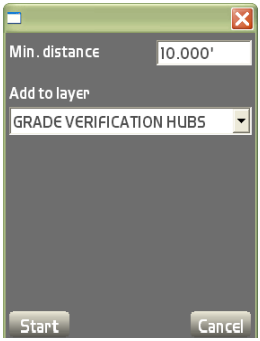


Figure 4-33. Polyline Dialog Box

Stake-out

Use the Stake-out menu in 3D GPS+ applications to stake-out points using different methods (Figure 4-34).

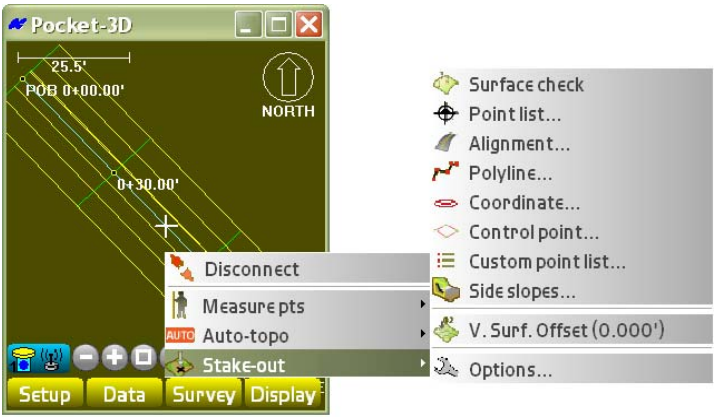


Figure 4-34. Stake-out Menu Options

Surface Check

To perform a surface check, tap **Survey** ▸ **Stake-out** ▸ **Surface check** (Figure 4-35).

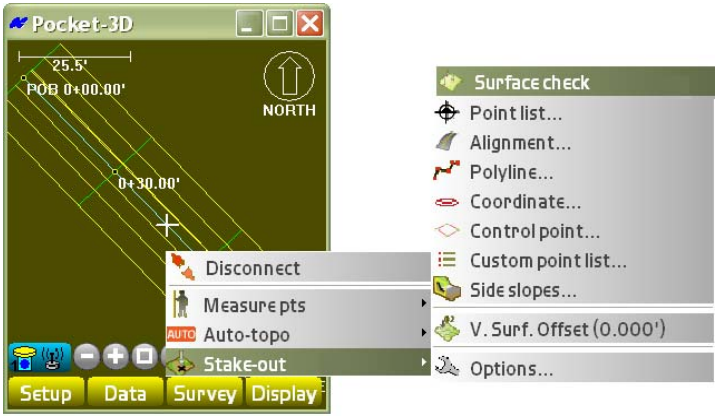


Figure 4-35. Survey ▸ Stake-out ▸ Surface Check

The main screen displays the cut/fill information and current elevation (Figure 4-36).

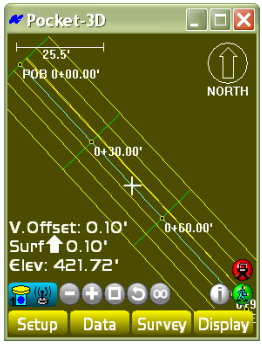


Figure 4-36. Surface Information

To measure a stake-out point, tap **Survey ▸ Stake-out ▸ Measure stake** (Figure 4-37).

Figure 4-37. Survey ▸ Stake-out ▸ Measure Stake

To stop the Surface check function, tap **Survey ▸ Stake-out ▸ Stop stake-out** (Figure 4-38).

Figure 4-38. Survey ▸ Stake-out ▸ Stop Stake-out

Cut/Fill "Real-Time" Updates

While in 'Surface Check' mode you can now see a tri-color grade indicator, similar to the one seen in the 3DMC software that gives real-time updates of cut/fill to the design surface.

To view real-time updates of the cut/fill to the design surface, do the following:

1. Tap **Survey** ▸ **Stake-out** ▸ **Surface Check** to display the cut/fill information and current elevation (Figure 4-36 on page 4-23).
2. Tap **Display** ▸ **Grade indicator** (Figure 4-39).

The Grade indicator option is only available when there is an active surface or alignment.

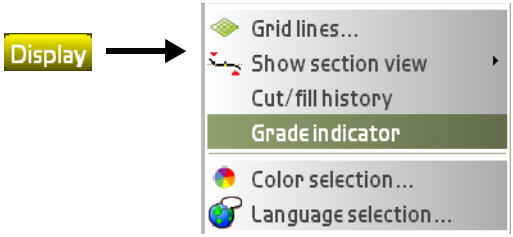


Figure 4-39. Real-Time Update of Cut/Fill

To adjust the grade indicator settings, hold down on the indicator to access a pop-up menu containing options for tolerances and grade (Figure 4-40 on page 4-26).

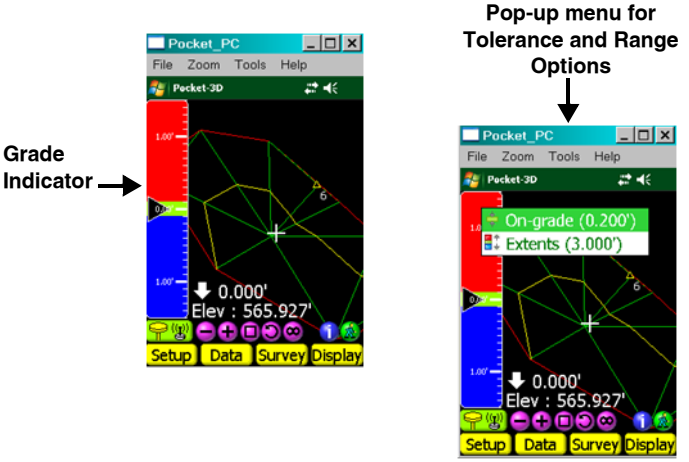


Figure 4-40. Grade Indicator Settings

See the following sections for details on the other menu selections during a stake-out:

- “Measure Stake” on page 4-44
- “V. Surface Offset” on page 4-54
- “Match Grade” on page 4-27
- “Options” on page 4-55

Match Grade

To match the grade at the current point during a surface check, tap **Survey ▸ Stake-out ▸ Match grade** (Figure 4-41).

Figure 4-41. Survey ▸ Stake-out ▸ Match Grade

Point List

To stake-out points from the selected point file, tap **Survey ▸ Stake-out ▸ Point list** (Figure 4-42).

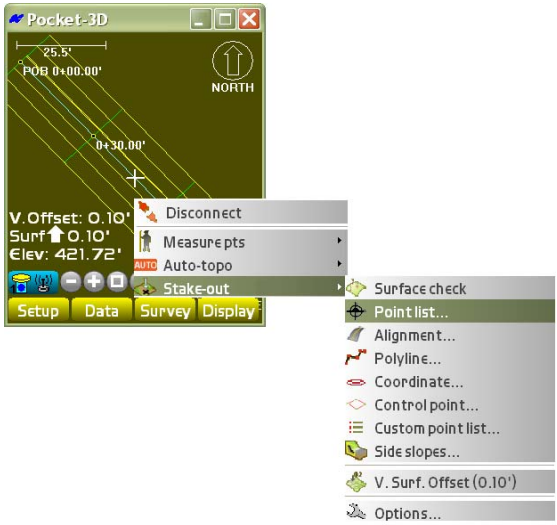


Figure 4-42. Survey ▸ Stake-out ▸ Point List

On the ***point list*** dialog box, select the layer and the point for stakeout, then press **Ok** (Figure 4-43).

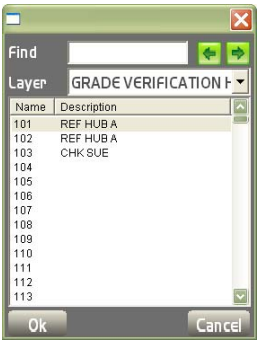


Figure 4-43. Point List Dialog Box

If the point to be staked lies outside the screen area, the main screen displays an arrow pointing in the direction of the point (Figure 4-44).

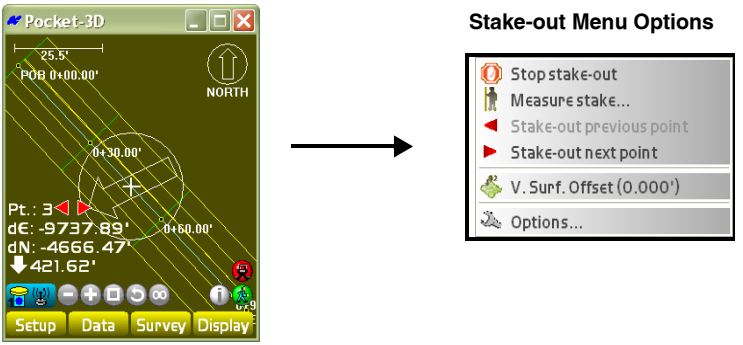


Figure 4-44. Main Screen Arrow

See the following sections for details on the other menu selections during a stake-out:

- “Measure Stake” on page 4-44
- “Stake-out Previous Point” on page 4-47
- “Stake-out Next Point” on page 4-48
- “V. Surface Offset” on page 4-54
- “Options” on page 4-55

To stop staking out the selected point, tap **Survey ▸ Stake-out ▸ Stop stake-out** (Figure 4-45).

Figure 4-45. Survey ▸ Stake-out ▸ Stop Stake-out

Alignment

To stake-out an alignment, tap **Survey ▸ Stake-out ▸ Alignment** (Figure 4-46).

Figure 4-46. Survey ▸ Stake-out ▸ Alignment

On the ***alignment stakeout parameters*** dialog box, select or enter ***Station*** and ***Elevation*** parameters, then press **Ok** (Figure 4-47 on page 4-31).

On the ***Stationing*** parameters tab (Figure 4-47 on page 4-31):

- Select one of the following stationing parameters for the alignment:
  - Running Station: calculates the target point for the current station along the alignment.
  - Closest Transition pt/vertex: select to display the target point at transition points or at the vertex between segments of the alignment.
  - Transition pts: select to stake-out transition points; only transition stations are used for stationing, e.g., ***POB >TC>CS>SC>CT>END***.
  - Interval pts: select to stakeout specific interval stations; the target circle will start at the station that you can choose from the station list and will jump to the next station that is at the interval entered into the interval field.
  - Transition/Interval: enter a value for the transition/interval between stations. The target circle will go to the next station in line, whatever is next, either a transition point or the specified interval.
  - Specific Station: select a station to begin the stake-out at from the drop-down list.
- Stationing – select either ***Alignment*** or ***Polyline*** stationing. When staking out an alignment, the stationing is always used along the CL of the alignment (you can't choose anything else at this point).
- Feature line – select the feature line to be staked from the drop-down list.

  This includes the centerline and all left/right feature lines as define in "Template Definition" of the alignment. The offset (left/right) will always be calculated to form this chosen feature line (perpendicular from the CL).
- Offset from feature line – enter an offset for the selected feature line or centerline to the left (negative number) or to the right (positive number). A dotted line will be drawn on the screen to display the offset line.

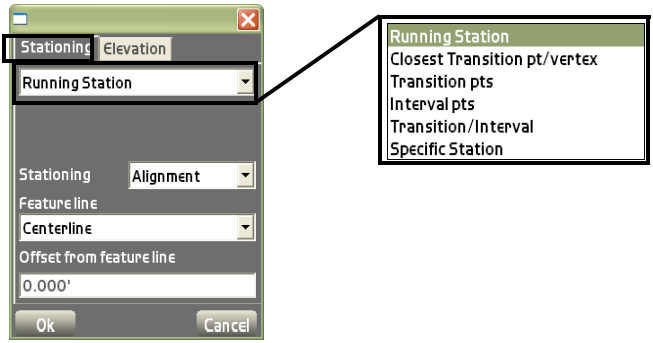


Figure 4-47. Alignment Stationing Parameters

On the ***Elevation*** parameters tab (Figure 4-48 on page 4-32):

- Select one of the following elevation parameters for the alignment:
  - Surface: the surface is whatever you have selected under Data Surface, i.e., a tin surface, road surface, or plane surface. If nothing was chosen here, Pocket-3D will not offer "Surface" as a selection in the drop-down list.
  - Extend grade at...: extends the position being used for cut and fill values, which are defined by the user.
  - Add user defined Grade...: extend centerline elevation at a user-defined slope.
  - Centerline: uses the defined centerline elevations of the alignment to report cut and fill values.
- Add vertical offset – enter a vertical offset in the ***V Offset*** field.

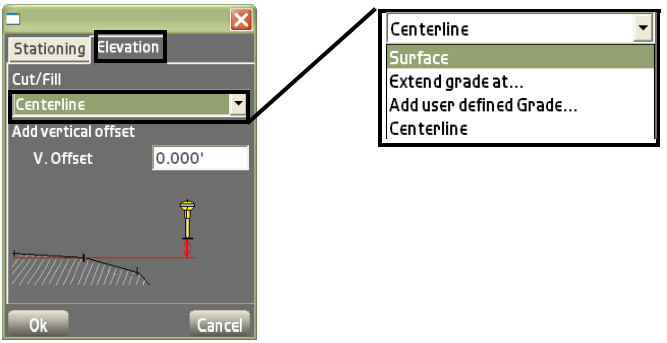


Figure 4-48. Alignment Elevation Parameters

Depending upon what Cut/Fill parameter is selected, different parameters are available (Figure 4-49).

The red dotted line displays the extended grade. The Cut/Fill value will be measured from the current range pole elevation to the elevation of the extended grade at the current position (double-red arrow) (Figure 4-48 and Figure 4-49).

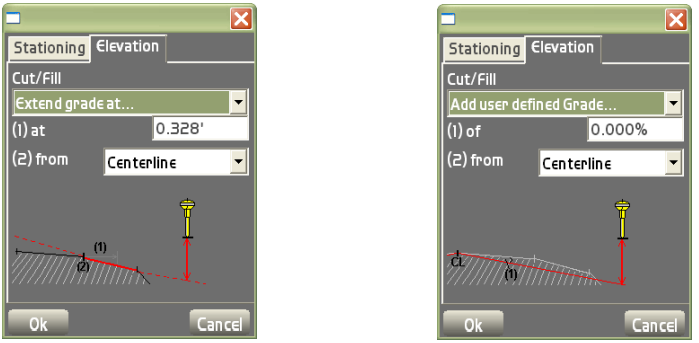


Figure 4-49. Cut/Fill Offset Parameters

If the point to be staked lies outside the screen area, the main screen displays an arrow pointing in the direction of the station (Figure 4-50 on page 4-33).

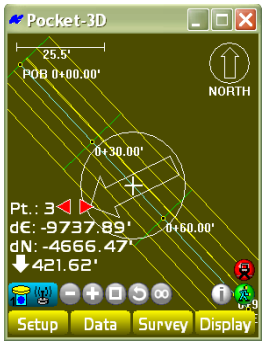


Figure 4-50. Main Screen Arrow

See the following sections for details on the other menu selections during a stake-out:

- “Measure Stake” on page 4-44
- “Stake-out Previous Point” on page 4-47
- “Stake-out Next Point” on page 4-48
- “V. Surface Offset” on page 4-54
- “Options” on page 4-55

To stop the stake-out, tap **Survey ▸ Stake-out ▸ Stop stake-out** (Figure 4-51).

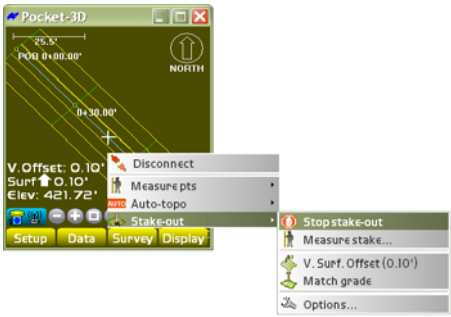


Figure 4-51. Survey ▸ Stake-out ▸ Stop Stake-out

Polyline

To stake out a polyline, tap **Survey ▸ Stake-out ▸ Polyline (**Figure 4-52**)**. See “Alignment” on page 4-29 for details on this dialog box.

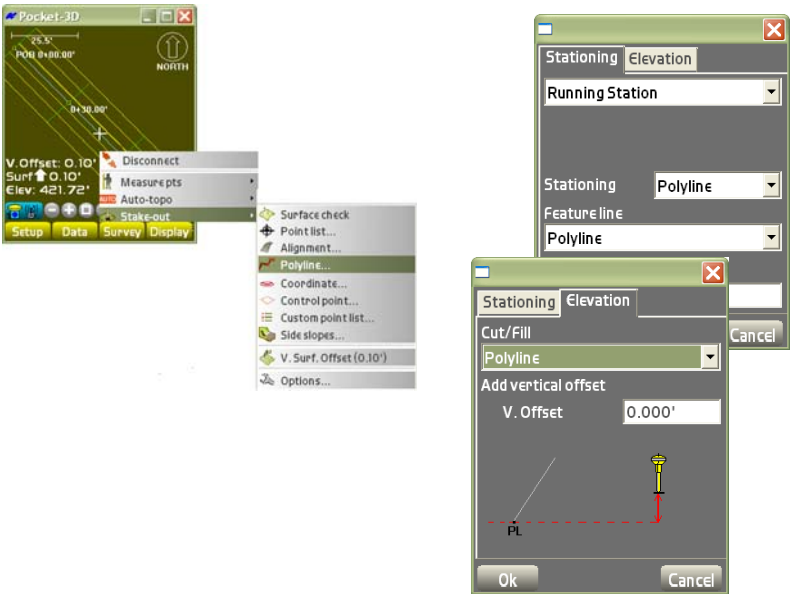


Figure 4-52. Stake-out a Polyline

Coordinate

To stake-out a coordinate, tap **Survey ▸ Stake-out ▸ Coordinate** (Figure 4-53).

Figure 4-53. Stake-out a Coordinate

On the ***coordinate*** dialog box, enter the desired ***Northing/X***, ***Easting/Y,*** and ***Elevation/Z*** coordinates to stake-out, then press **Ok** (Figure 4-54).

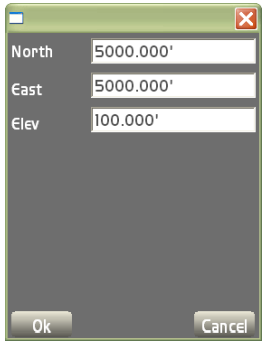


Figure 4-54. Coordinate Dialog Box

If the point to be staked lies outside the screen area, the main screen displays an arrow pointing in the direction of the coordinate (Figure 4-55 on page 4-36).

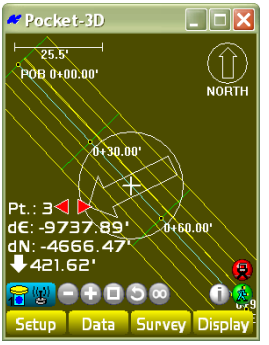


Figure 4-55. Main Screen Arrow

See the following sections for details on the other menu selections during a stake-out:

- “Measure Stake” on page 4-44
- “V. Surface Offset” on page 4-54
- “Options” on page 4-55

To stop staking out the coordinate, tap **Survey ▸ Stake-out ▸ Stop stake-out** (Figure 4-56).

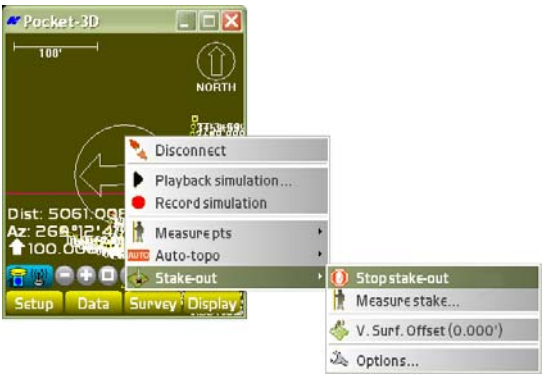


Figure 4-56. Survey – Stop stake-out

Control Point

To stake-out a control point from the selected control point file, tap **Survey ▸ Stake-out ▸ Control Point** (Figure 4-57).

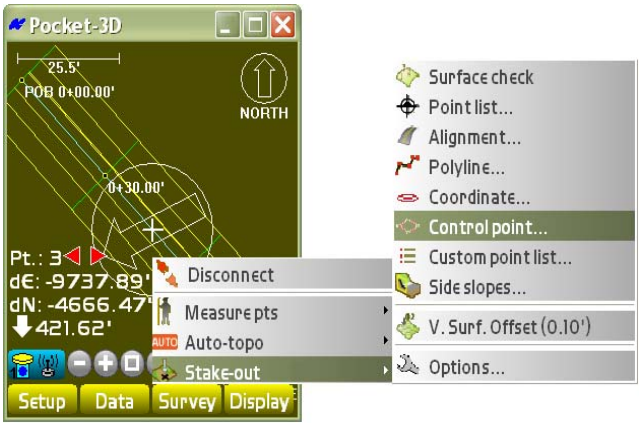


Figure 4-57. Stake-out a Control Point

On the ***control point stakeout*** dialog box (Figure 4-58 on page 4-37), select the desired control point for stakeout and press **Ok**.

Figure 4-58. Control Point

If the point to be staked lies outside the screen area, the main screen displays an arrow pointing in the direction of the control point (Figure 4-59 on page 4-38).

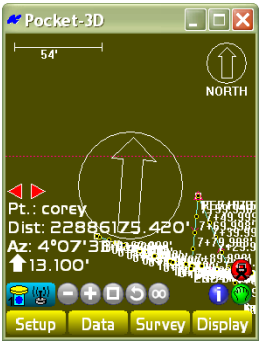


Figure 4-59. Main Screen Arrow

See the following sections for details on the other menu selections during a stake-out:

- “Measure Stake” on page 4-44
- “Stake-out Previous Point” on page 4-47
- “Stake-out Next Point” on page 4-48
- “V. Surface Offset” on page 4-54
- “Options” on page 4-55

To stop staking out the selected control point, tap **Survey ▸ Stake-out ▸ Stop stake-out** (Figure 4-60).

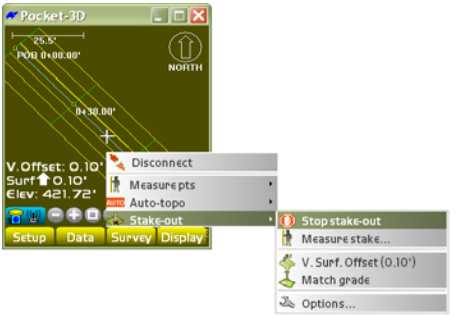


Figure 4-60. Survey – Stop Stake-out

Create/Edit Custom Point List

To create a custom point list, tap **Survey ▸ Stake-out ▸ Create custom point list** (Figure 4-61).

To edit a current custom point list, tap **Survey ▸ Stake-out ▸ Edit custom point list** (Figure 4-61).

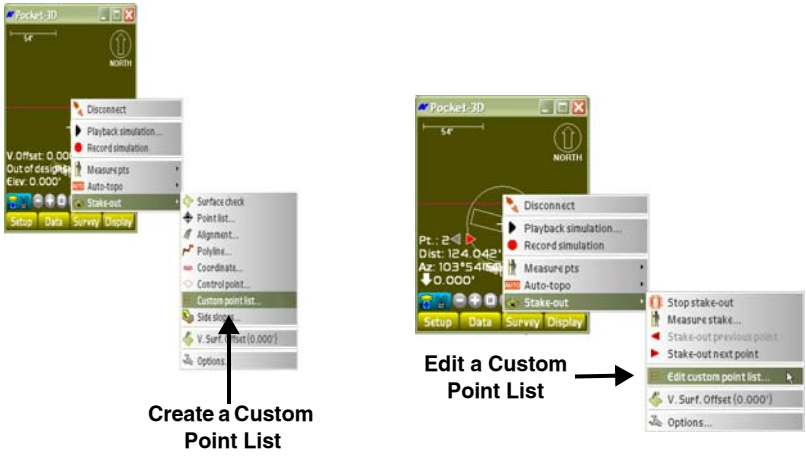


Figure 4-61. Create/Edit Custom Point List

On the Available tab, select points to include in the custom point list (Figure 4-62 on page 4-40).

- Type – select either Points or Control points from the drop-down list.
- Points/Control Points list – displays all points in the active point/control point files.
- Find – enter a point number you wish to find and the matching point will be highlighted in the list.
- – tap to select a point/control point that displays on the ***Selected*** tab (Figure 4-63 on page 4-40).

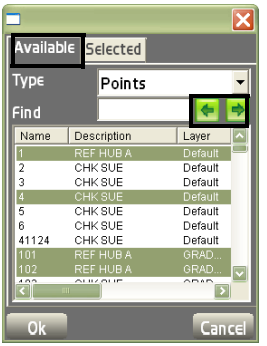


Figure 4-62. Custom Point List – Available

The ALT key on the FC-200 can be used to make multiple selections.

On the Selected tab, view the custom points/control points list created using points selected on the ***Available*** tab (Figure 4-63).

- Up arrow button – tap to move the highlighted point up the list.
- Down arrow button – tap to move the highlighted point down the list.
- Delete (minus) button – tap to remove the highlighted point from the custom point list.

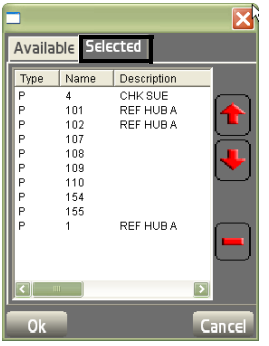


Figure 4-63. Custom Point List – Selected

When done, press **Ok** to begin staking out the custom point list.

Side Slopes

To stake out points on a side slope or a cross-section slope, tap **Survey ▸ Stake-out ▸ Side Slopes (**Figure 4-64**)**.

Figure 4-64. Stake out Points on a Side Slope

On the ***Stake-out*** dialog box, enter or select the following information and press **Ok** (Figure 4-65 on page 4-42).

- Running Station – calculates the target point for the current station along the alignment.
- Regular station/transition – displays the target point for regular stations at a user-specified interval and/or at transition points between segments of the alignment:
  - Transition pts only: select to only stakeout at transition points.
  - Interval stations only: select to only stakeout stations at a user-specified interval.

    NOTE: Deselect both check boxes to stakeout at both Transition pts and Interval stations.
  - Interval: enter a value for the interval between stations.
  - Road surface list: select the current road surface to begin the stake-out at from the drop-down list.
- Random station – enable to manually enter a station number at which to begin the stakeout.

- Define Cross-section – enable to define cross section slope measurements (Figure 4-66 on page 4-43). The ***Crosssection*** and ***Image*** tabs activate (Figure 4-66 on page 4-43).

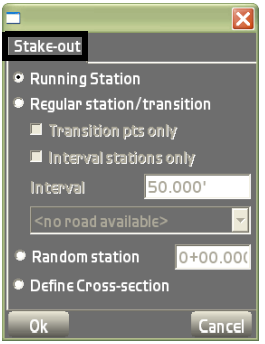


Figure 4-65. Stake-out Dialog Box

On the ***Crosssection*** tab, enter the following parameters for the cross-section slope (Figure 4-66 on page 4-43).

- **Centerline (CL) point** – the coordinates of the point at the start of the centerline of the cross-section.
  - North: enter the northing parameter.
  - East: enter the easting parameter.
- 1.Dir. of Xsection – enter the direction of the cross section.
- 2.Slope value – enter the percentage of the cross section slope.
- 3.Toe of slope – the point at the beginning of the cross section slope.
- Elev: enter elevation at the toe of the slope.
- Dist. from CL: enter the horizontal distance of the Toe of slope point from the Centerline point specified above.
- **Measure** – press to measure the point.

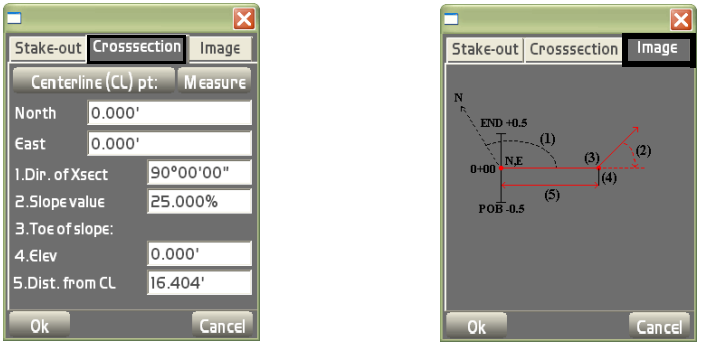


Figure 4-66. Enter Parameters for Cross-section Slope

The corresponding ***Image*** tab illustrates the measurements described on the ***Crossection*** tab.

The section view on the main screen displays the cut/fill value from the current elevation to the side-slope and the current station (Figure 4-67).

Figure 4-67. Side Slopes Screen

See the following sections for details on other menu selections during a side slope/cross section slope stake-out.

- “Measure Stake 1” on page 4-49
- “Sideslope Options” on page 4-53
- “V. Surface Offset” on page 4-54
- “Options” on page 4-55

To stop the side slope stake-out, tap **Survey ▸ Stake-out ▸ Stop stake-out** (Figure 4-68).

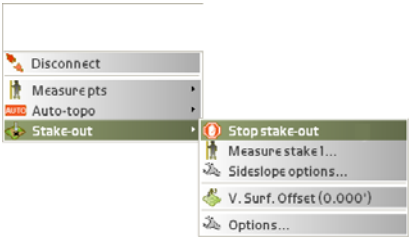


Figure 4-68. Stop Side Slope Stake-out

Measure Stake

The Measure stake menu is available during point list, alignment, or side slope stakeouts. To activate the measure stake menu, tap **Survey ▸ Stake-out ▸ Point list / Alignment / Create custom point list / Side slopes**.

To measure the point or alignment tap **Survey ▸ Stake-out ▸ Measure stake** (Figure 4-69).

Figure 4-69. Survey ▸ Stake-out ▸ Measure Stake

The ***Measuring*** dialog box displays, then the ***results*** screen shows the following information, depending on the stake-out point method

(Table 4-1).

Table 4-1. Results Screen

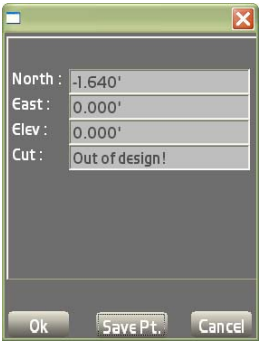
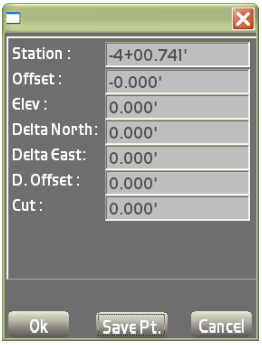
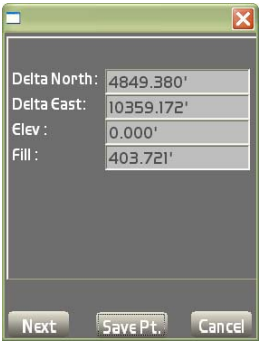
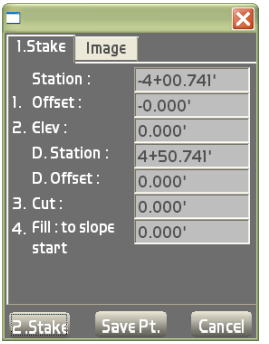
Stake-out Point Method	Results Screen
Surface Check • North – shows the distance North of the surface being staked. • East – shows the distance East of the surface being staked. • Elev – shows the current elevation. • Cut/fill – shows the current cut/fill information. • **Ok** – press to save and return to the Main Screen. • **Save Pt.** – press to save a control point and its respective information.	
Alignment / Polyline • Station – shows the current position of the station. • Offset – shows the offset number from the stationing line. • Elev – shows the elevation point. • Delta North – shows the target point north of the measured stake/your current position. • Delta East – shows the target point east of the measured stake/your current position. • D. Offset – shows the offset to the right of the design station. • Cut/Fill – shows the cut/fill value in relation to the design surface. • **Ok** – press to save and return to the Main Screen. • **Save Pt.** – press to save a control point and its respective information.	

Table 4-1. Results Screen (Continued)

Stake-out Point Method	Results Screen
Coordinate / Control point / Custom Point List / Edit control point list • Delta North – shows the distance North of the point being staked out. • Delta East – shows the distance East of the point being staked out. • Elev – shows the elevation point. • Cut/Fill – shows the cut or fill value in relation to the design surface. • **Ok** – returns to the main screen. • **Save Pt.** – press to save a control point and its respective information.	
Side Slopes / Cross section slope 1.Stake • Station – shows the station number. • Offset – shows the elevation point. • Elev – shows the elevation point. – D.Station: shows northern information for the stake-out. – D.Offset: shows eastern information for the stake-out. • Cut: – shows the cut value in relation to the design surface. • Fill : to slope start – shows the fill value at the beginning of the slope • **Ok** – returns to the main screen. • **Save Pt.** – press to save a control point and its respective information.	

On the ***results*** screen above (Table 4-1):

- Press **2.Stake** to measure a second point on the side slope.
- Press **Save Pt.** to enter or select the following (Figure 4-70 on page 4-47):
  – Pt. number: enter the point number.

– Description: enter the point description (if preferred).

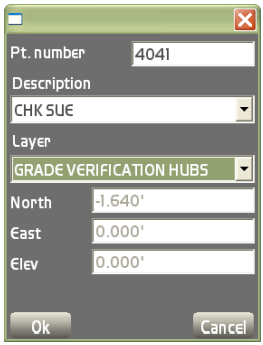


Figure 4-70. Point and Alignment Screens

- Layer – tap select a new layer to the Point file from the drop-down entry-box. After entering the layer's parameters, press **Ok** to save the information.
- North – see (Table 4-1) for more information.
- East – see (Table 4-1) for more information.
- Elev – see (Table 4-1) for more information.

Stake-out Previous Point

To activate the Stake-out previous point menu (Figure 4-71 on page 4-48), first stake out a point.

To stake out the previous point, tap **Survey ▸ Stake-out ▸ Stake-out previous point**. This menu option is only available for point list and control point stake-outs.

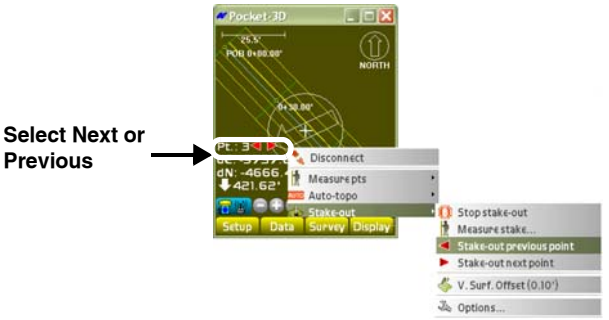


Figure 4-71. Survey ▸ Stake-out ▸ Stake-out Previous Point

The red arrows allows you to select the next or previous point (if applicable).

Stake-out Next Point

To stake-out the next point, tap **Survey ▸ Stake-out ▸ Stake-out next point** (Figure 4-72). This menu option is only available for point list and control point stake-outs.

Press the Enter key on the body of the controller to stake-out the next point (rather than using the menu option).

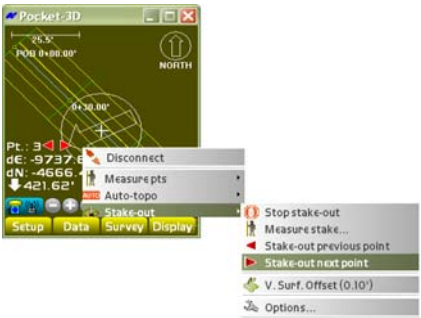


Figure 4-72. Survey ▸ Stake-out ▸ Stake-out Next Point

Measure Stake 1

The Measure stake 1 menu is available during side slope or cross section slope stakeouts only. To activate the Measure Stake 1 menu (Figure 4-73), first stake out a side slope. See “Side Slopes” on page 4-41, then tap **Survey ▸ Stake-out ▸ Measure stake 1**.

Figure 4-73. Measure Stake 1 on the Slope

The ***Measuring*** dialog box displays, followed by the ***results*** screen (Figure 4-74). The corresponding ***Image*** tab illustrates the measurements described on the ***1.Stake*** tab.

The ***1.Stake*** tab displays the results of the first point (Measure Stake 1) staked out on the side slope.

- Station – displays the station of the first stake.
- 1. Offset – displays the horizontal distance from the centerline point to the first stake.
- 2. Elev – displays the elevation at the top of the first stake.
  - Delta North: shows north information during a measurement/ stake-out.
  - Delta East: shows east information during a measurement/ stake-out.
- Cut/(Fill) – displays the cut value from the top of the stake to the slope intersecting point. This will always be a cut value if done correctly.

- Cut: to slope start – displays the cut value from the top of the second stake to the intersecting mark on the first stake.

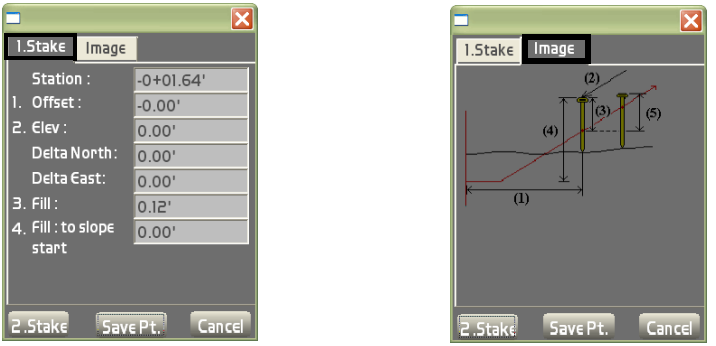


Figure 4-74. Measure Stake 1 and Image Results Screen

Measure Stake 2

The Measure stake 2 menu is available during side slope or cross section slope stakeouts only. To view Measure Stake 2 parameters, press the **2.Stake** button on the ***results*** screen of Measure Stake 1 (Figure 4-74 on page 4-50).

Tap **Survey** ▸ **Stake-out** ▸ **Measure stake 2** (Figure 4-75) to measure the parameters of Measure Stake 2.

Figure 4-75. Measure Stake 2 on the Slope

The ***Measuring*** dialog box displays, followed by the ***results*** screen (Figure 4-76 on page 4-51). The corresponding ***Image*** tab illustrates the measurements described on the ***2.Stake*** tab.

The ***2.Stake*** tab displays the results of the second point (Measure Stake 2) staked out on the side slope.

- Station – shows the station number for Measure Stake 2.
- 1. Offset – displays the horizontal distance from the centerline.
- 2. Elev – displays the elevation at the top of the second stake.
  - Delta North: shows north information during a measurement/ stake-out.
  - Delta East: shows east information during a measurement/ stake-out.
- Cut/Fill – displays the distance from the top of the second stake to the intersecting point along the stake. This will always be a cut value if done correctly.
- Cut: to slope start – displays the cut value from the top of the second stake to the bottom of the slope.
- Cut: design at 1st stake – displays the cut value from the top of the second stake to the intersecting mark on the first stake.

The ***2.Stake*** tab shows the same parameters as 1.Stake tab described under “Measure Stake 1” on page 4-49.

Figure 4-76. Results Screen for Measure Stake 2

The section view on the main screen displays station number, vertical location, and horizontal location of the staked out point on the slope (Figure 4-77 on page 4-52).

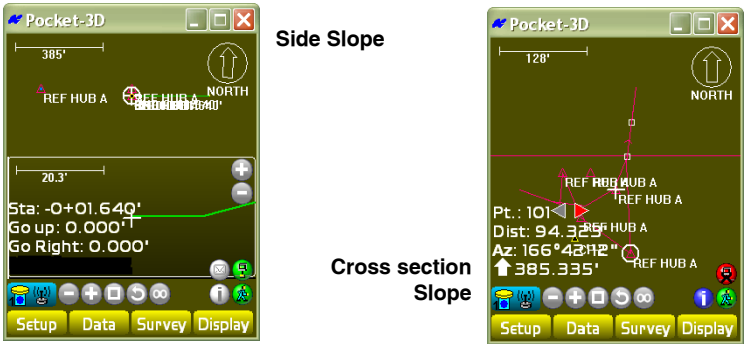


Figure 4-77. Side Slopes/Cross-section Slopes Section View Screen

Stake-out Previous Point

To activate the Stake-out previous point menu options, first stake out points on a side slope (see“Side Slopes” on page 4-41).

To stake out the previous point, tap **Survey ▸ Stake-out ▸ Stake-out previous point (**Figure 4-78**)**. This menu option is only available if “Regular station/transition” is selected on the ***Stake-out*** dialog box when staking out points on a side slope. See “Side Slopes” on page 4-41 for more information.

Figure 4-78. Survey ▸ Stake-out ▸ Stake-out Previous Point

Stake-out Next Point

To activate the Stake-out next point menu, first stake out points on a side slope (See “Side Slopes” on page 4-41).

To stake out the next point, tap **Survey ▸ Stake-out ▸ Stake-out next point (**Figure 4-79**)**. This menu option is only available if “Regular station/transition” is selected on the ***Stake-out*** dialog box when staking out points on a side slope. See “Side Slopes” on page 4-41 for more information.

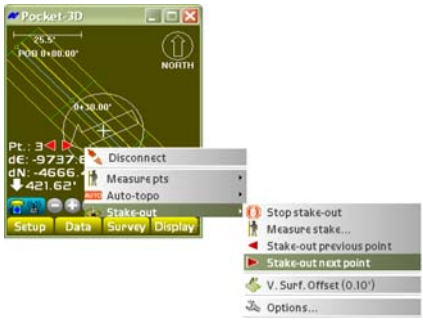


Figure 4-79. Survey ▸ Stake-out ▸ Stake-out Next Point

Sideslope Options

To view or change options for slope or cross-slope stake-out measurements only, tap **Survey ▸ Stake-out ▸ Sideslope Options** (Figure 4-80).

Figure 4-80. Slope Options for Side/Cross-Section Slopes

On the ***Slope Options*** dialog box, enter parameters to calculate the target point, then press **Ok** (Figure 4-81 on page 4-54).

- Insert 1st Stake at – select either ***Cut/Fil***l or ***Dist from Daylight*** to calculate the 1st stake's position.
  - 1. Cut/Fill: enter the desired cut value between the slope and the current position.

    The target point will be set at the position where this cut value is the same as that from the slope to the current position.
  - 2. Dist from Daylight: enter a horizontal distance that represents the desired distance from the daylight point to the 1st stake.
- 3. Offset to 2nd stake – enter the desired horizontal distance from ***Measure Stake 1*** to ***Measure Stake 2***.

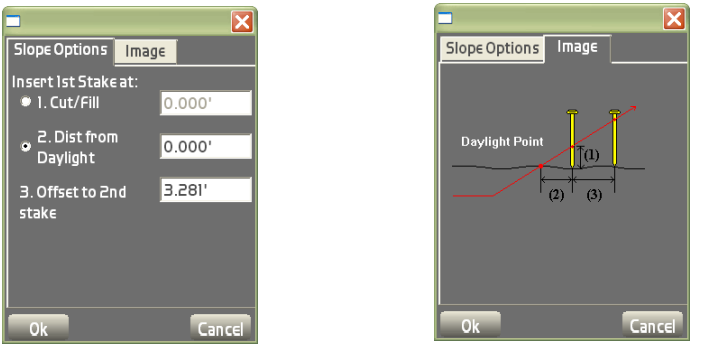


Figure 4-81. Survey ▸ Stake-out ▸ Slopes ▸ Options

The ***Image*** tab illustrates the measurements described on the ***Slope Options*** tab.

V. Surface Offset

To add an extra vertical surface offset to a point or surface file, tap **Survey ▸ Stake-out ▸ V. Surface Offset**. On the small pop-up keyboard, enter the value for the extra vertical offset, then press **Ok**

(Figure 4-82).

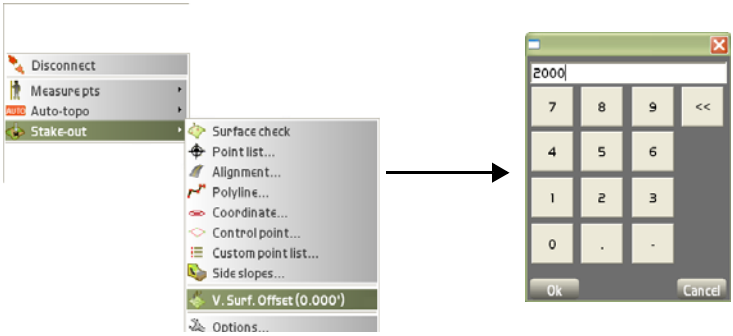


Figure 4-82. Vertical Surface Offset

Options

To view or change options for stake-out measurements, tap **Survey ▸ Stake-out ▸ Options** (Figure 4-83).

Figure 4-83. Survey ▸ Stake-out ▸ Options

On the ***stakeout options*** dialog box, select the desired options for stakeout measurements, cut sheet, and audio, then press **Ok** (Figure 4-84 on page 4-56).

***Measure* tab** sets the way to measure/stake-out points and alignments and the information to display on the main screen during a measurement/stake-out.

- Press ENTER to measure – enable to use the Enter key (on the controller's casing, below the display screen) to start the measurement on each stakeout point or alignment.

- Enable Auto-Zooming – enable to zoom in so that the target point and the current location of the rover will always be seen on the main screen. If the rover comes closer to the target point, Pocket-3D will automatically zoom in to get a closer look. The scale bar will turn red to signify that Pocket-3D zoomed in or out.

If zoom in or zoom out is selected separately, auto zooming will be disabled for the current target and will be activated again at the next target.

- Show following details – select the desired details to show on the main screen during a stake-out.
  - Points: select to show either ***Dist,Az, In/Out,L/R,*** or ***dE,DN*** from the drop-down list.
  - Alignments/Polylines: select to show either along the line, ***Dist,AZ,*** or ***dE,dN*** from the drop-down list.

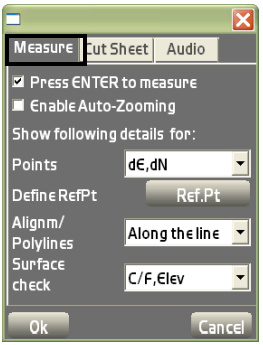


Figure 4-84. Stake Out Measurement Options

Cut Sheet **tab –** collects user-defined data for measured points, alignments, etc.

- Enable cut sheets – check mark this box to enable cut sheet collection.
- Target text file – press the browse button to store the cut sheet.
- Append to target file – check mark this box to add the current target file.
- Logging format – select the format you want for the cut sheet from the drop-down list.

NOTE: A logging format must be defined prior to selecting a target file.

- **Format** – press to display the ***Logging format*** dialog box.

On the ***Logging format*** dialog box, do the following:

- **New** – press to create a new logging format. The ***logging parameters*** dialog box displays (Figure 4-85).
  - Name: enter a name for the logging format from the pop-up keyboard.
  - Extension: select a file extension type.
  - Append: select a parameter (***spaces, comas, tabs***) from the drop-down box to add to your target file.
  - Type: select the type of information to be stored from the drop-down list to add the preferred information to be stored for the previously defined format.

    Your selection displays in the field below.
- **Add/Delete** – the selection from the ***Type*** selection displays here. Press **Delete** to remove that selection.

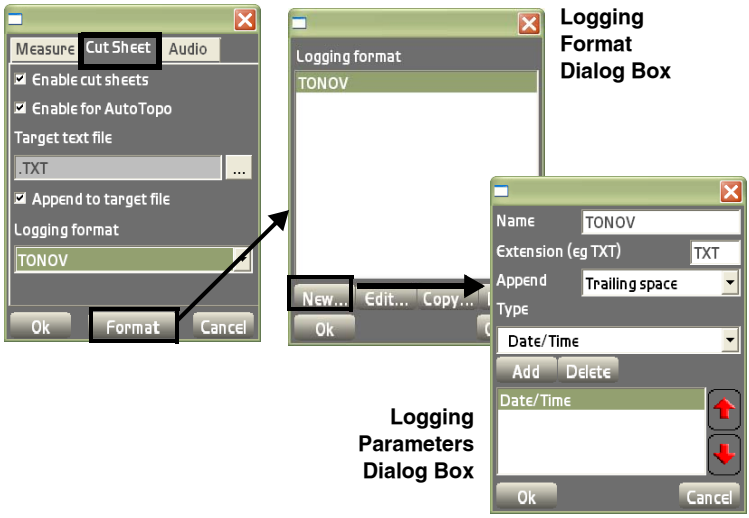


Figure 4-85. Creating Cut Sheets

- **Edit** – press to edit all existing formats.
- **Copy** – press to copy existing formats.
- **Delete** – press to delete the highlighted format.

***Audio* tab** an internal, Pocket-3D voice recites the cut/fill value rounded to the nearest tenth of a foot.

- Report cut/fills to surface – enable to audibly report the cut/fills to the surface.
- Time interval (secs) – enter the desired time interval in seconds for the voice to recite the cut/fill.
- Proximity beep – enable to alert the user when approaching the selected stakeout function.

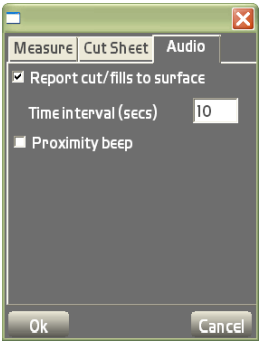


Figure 4-86. Measure and Audio Option Tabs

Total Station Survey Applications

In total station survey applications, the Survey menu (Figure 4-87 on page 4-59) has the following additional menu items. Many survey and stakeout functions are the same for GPS and total station applications. The following sections note the differences. The type of instrument configured determines the available menu items.

- Connect/Disconnect
- Measure pts

- Auto-topo/Stop auto-topo
- Stake-out

Connect/Disconnect Total Station

To enable or disable a connection with a total station, tap **Survey ▸ Connect/Disconnect (**Figure 4-87).

Total Station – Disconnected **Total Station –**

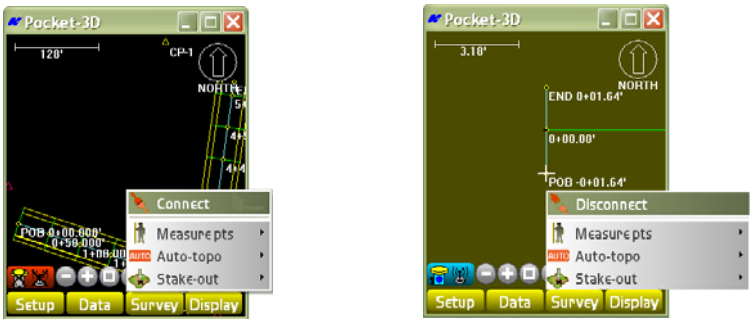


Figure 4-87. Connect/Disconnect to Total Station

Measure Points

The Measure pts menu collects points, points with offsets, a reference line, and polylines in the field. The following sections note only the differences in these menus for total station applications.

For further details on the Measure pts menu options and setup screens, see “Measure Points” on page 4-59.

Topo-shot With Offset

To collect a topo-shot with offset, tap **Survey ▸ Measure pts. ▸ Topo-shot w. offset**. See “Topo-shot” on page 4-3 for details on the topo-shot tab.

On the Offset tab, enter the actual location where the collected shot was taken, then press **Ok (**Figure 4-88 on page 4-60**)**.

To select the location of this measurement press the **Above** button to toggle between **Above/Below**.

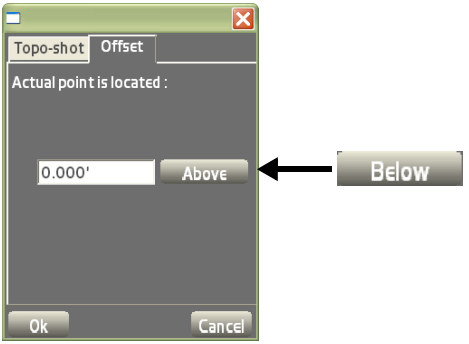


Figure 4-88. Topo-shot with Offset – Offsets

Options

To view or change options for point measurements with a total station, tap **Survey ▸ Measure pts ▸ Options**.

On the ***Topo-shot options*** tab, select the desired options for topo-shot measurements, then press **Ok** (Figure 4-89 on page 4-61).

- Prompt for pt. details – enable to prompt for point details every time a topo-shot is measured
  - Before: enable this option to prompt for point details before the topo-shot is measured
  - After: enable this option to prompt for point details after the topo-shot is measured
- Minimum Requirements:
- Press ENTER to measure – enables the Enter key on the controller's casing for measuring each topo-shot
- Require RTK initialized – enable to measure points with only RTK initialized.

  If you choose this option, this will skip autonomous and float positions.
- Require MMGPS signal – enable to measure points using only the mmGPS signal, which means skipping positions without mmGPS signal (e.g., GPS only).

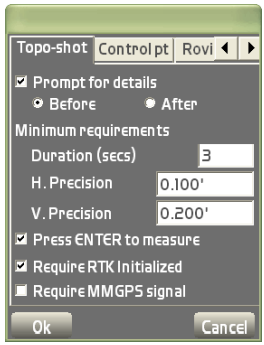


Figure 4-89. Measure Point Options

Stake-out

Used in total station applications to stake-out points using different methods. The following section notes only the differences in these menus for total station applications.

For further details on the Stake-out menu options and setup screens, see "Stake-out" on page 4-22.

Options

To view or change options for stake-out measurements, tap **Survey ▸ Stake-out ▸ Options**.

On the ***stakeout options*** dialog box, select the desired options for stakeout measurements and audio, then press **Ok (**Figure 4-90 on page 4-63**)**.

The Measure tab sets the way to measure/stake-out points and alignments and the information to display on the main screen during a measurement/stake-out.

- Press ENTER to measure – enable to use the Enter key (on the controller's casing, below the display screen) to start the measurement on each stakeout or alignment.
- Enable Auto-Zooming – enable to zoom in so that the target point and the current location of the rover will always be seen on the screen. If the rover comes closer to the target point, Pocket-3D

will automatically zoom in to get a closer look. The scale bar will turn red to indicate that Pocket-3D zoomed in or out.

- Show deltas to target from – select the target from which to show deltas.
  - Prism: shows the deltas from the prism during a measurement.
  - Instrument: shows the deltas from the instrument during a measurement.
- Show following details for – select the desired details to show on the main screen during a stake-out.
  - Dist, Azimuth: select to show distance and azimuth information during a measurement/stake-out.
  - Dist, Offset: select to show a distance and offset during a measurement/stake-out.
  - Delta E, Delta N: select to show east/north information during a measurement/stake-out.

The Cut Sheet tab, select to do the following:

- Enable cut sheets – turns on/off at sheet collection.
- Targeted text file –select the location in which to store the cut sheet from the drop-down list.
- Append to target file – enable to append the current target file.
- Logging format – select the desired format for the cut sheet from the drop-down list.

The Audio tab, select to have an internal, Pocket-3D voice recite the cut/fills value rounded to the nearest tenth of a foot.

- Report cut/fills to surface – enable to audibly report the cuts/fills to the surface.
- Time interval (secs) – enter the desired time interval in seconds for the voice to recite the cut/fill.

- Proximity beep – enable to alert the user when approached the selected stakeout function.

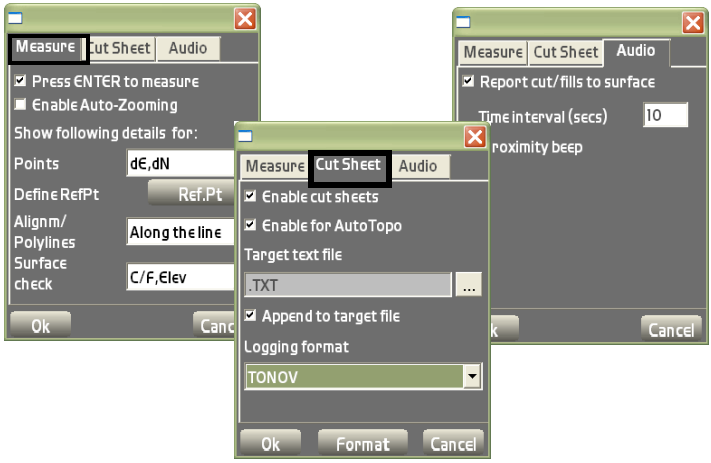


Figure 4-90. Stake-out Options for Total Station Applications

See “Total Station Survey Applications” on page 4-58 for measure points and stake out definitions.

Robotic Survey Applications

For Robotic applications, the Survey menu (Figure 4-91 on page 4-64) has the following menu items:

- Connect/Disconnect
- Start/Stop tracking
- Turn Face
- Turn Instrument
- Auto-topo

Connect/Disconnect To Connect/Disconnect the total station, click **Survey ▸ Connect/Disconnect.**

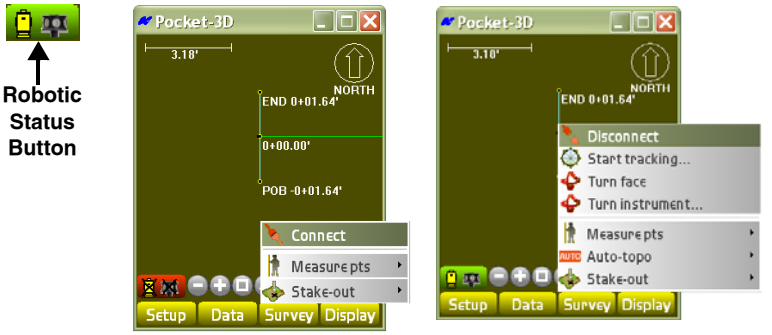


Figure 4-91. Survey Menu

When you press **Connect** the Robotic status button turns green. If you press **Disconnect** the robotic status button turns red (Figure 4-91).

If there is an X marked across the prism icon, it is connected, but not tracking (Figure 4-92).

Figure 4-92. Connected But Not Tracking

Click **Survey ▸ Start/Stop Tracking ▸ Turn instrument.**

Turn instrument, Qlock, and Turn face options are only available when you are NOT TRACKING.

To turn the instrument to the rover, click **Survey ▸ Connect**, then **Survey ▸ Turn instrument.** Then press **Survey ▸ Start tracking**.

The ***turn total station*** menu displays (Figure 4-93).

Do the following to turn the total station:

1. Press **Qlock** to call the instrument through the RC3 (Figure 4-93).
2. Press **Turn face** to turn the total station (Figure 4-93).

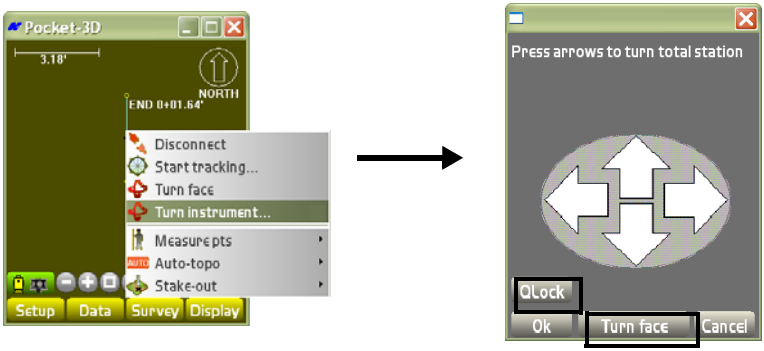


Figure 4-93. Turn the Total Station

For more information on the Survey menu robotic applications, i.e., the Measure points, Auto-topo, and Stake-out, see “Total Station Survey Applications” on page 4-58.

Start/Stop Tracking

To start or stop tracking a total station, tap **Survey ▸ Start/Stop tracking** (Figure 4-94).

Figure 4-94. Start/Stop Tracking of Total Station

Turn Face

To display the Turn Face menu option tap **Setup ▸ Equipment**. Follow the instructions for a range-pole setup. See “Total Station Survey Applications” on page 4-58 for more information.

Figure 4-95. Turn Face

Select the “RC (Ext. Link)” for Connection type on the ***Advanced*** dialog box (Figure 4-96 on page 4-66). See “Total Station Applications” on page 2-29 for more details.

Tap **Survey ▸ Connect**, then press **Survey ▸ Turn face**. Pressing Turn Face returns you to the main screen.‘

Advanced Dialog Box

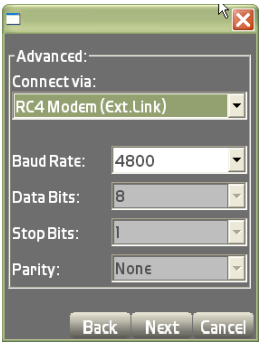


Figure 4-96. Select Total Station Connection Type

See “Auto-topo/Stop Auto-topo” on page 4-16 for information on this application.

Turn Instrument

To turn an instrument with a total station, tap **Survey ▸ Connect**, then press **Survey ▸ Turn instrument**. The turn **total station** menu displays (Figure 4-97 on page 4-67).

Pressing the **Turn face** button will turn the total station 180 degrees while rotating it vertically 180 degrees. This will cause the total station to show the opposite face of the instrument while pointing in the previous direction.

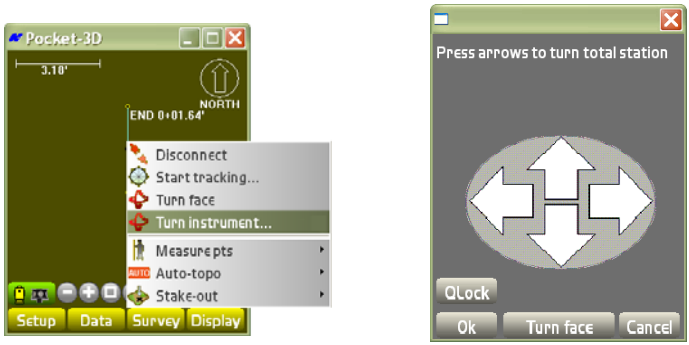


Figure 4-97. Turn Total Station

Reflectorless Application

To enable/disable the use of a reflectorless total station, tap **Survey ▸ Reflectorless** (Figure 4-98 on page 4-68).

A check mark indicates that a reflectorless total station is being used. In this mode, the Auto-topo menu options are unavailable.

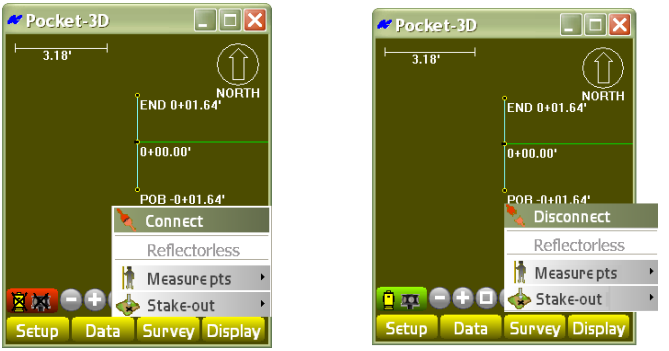


Figure 4-98. Survey – Reflectorless Menu

See “Total Station Survey Applications” on page 4-58 for measure points and stake out definitions.

Measure Points option applies to Conventional Total Stations, Robotics, and Reflectorless applications.

Display Menu

The Display menu (Figure 5-1) has the following menu items:

- Zoom
- Cursor
- Show
- Orientation
- Grid lines
- Show section view
- Cut/fill history
- Grade indicator
- Color selection
- Language selection
- About Pocket-3D

Some menu options depend on the type of file open and the jobsite application.

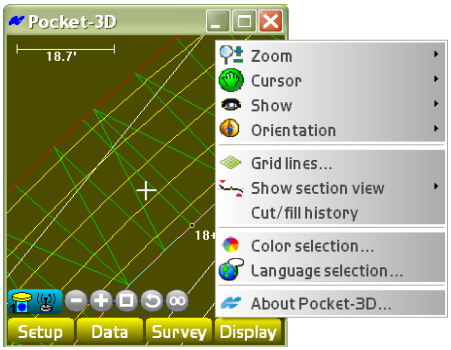


Figure 5-1. Display Menu – Example

Zoom

The **Zoom** Display menu option allows you to zoom in or out of the main screen. You can also select an area to view.

To choose a zoom function, tap **Display ▸ Zoom** (Figure 5-2).

- Zoom in – magnifies the main screen by 25%; zooms in around the main screen.
- Zoom out – magnifies the main screen by -25%; zooms out around the main screen.
- Zoom window – zooms to a window drawn on the main screen.
- Zoom extents – displays the extent of the project.
- Zoom prev. – displays the previous view.

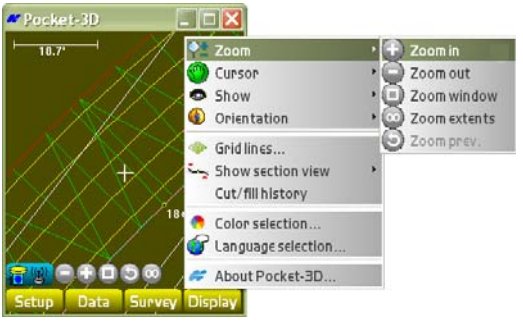


Figure 5-2. Zoom Options

Cursor

To switch the main screen between views, tap **Display ▸ Cursor** (Figure 5-3).

- Pan – moves the main screen around by pressing down on the screen and dragging it.
- Select – selects a point, points, and/or a polyline on the main screen when tapping on them, or drawing a box around them.
- Polygon – selects a point, points, and/or a polyline on the main screen when creating a polygon around them.
  - To draw a polygon, tap once on the screen to start the polygon, then tap as many points around the screen as desired.
  - To close the polygon, tap the last point and drag a line to connect with the first point. When all lines of the polygon turn to thick white lines, lift off the screen.
- Auto pan – available only if GPS or LPS are connected. The view of the screen pans automatically as the user moves around the project site.

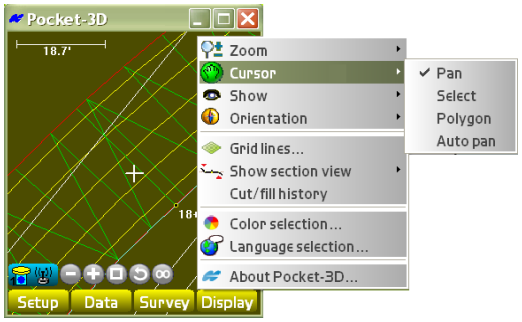


Figure 5-3. Cursor Options

On the tool bar, click to rotate through the cursor options.

Show

To display main screen reference items, tap **Display ▸ Show** (Figure 5-4).

- Scale bar – shows/hides the scale bar, which shows the current scale of the view on the screen to the jobsite.
- North arrow – shows/hides the north arrow, which points North.
- Reference line – shows/hides the reference line defined (selected to use) for certain measuring functions.

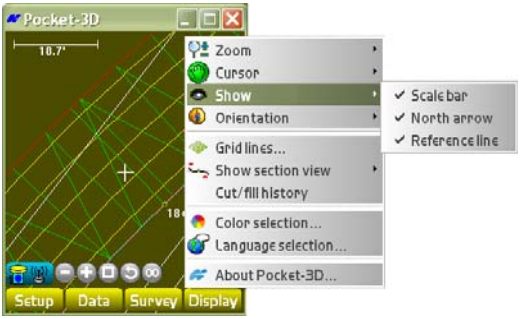


Figure 5-4. Show Options

Orientation

To change the orientation of the arrow while in stake-out mode, tap **Display ▸ Orientation** (Figure 5-5).

- To north – orients the arrow to point north.
- Current direction – orients the arrow to point in the direction of travel.
- Up station – orients the arrow to point up a station along the alignment.
- Down station – orients the arrow to point down a station along the alignment.

Some menu options depend on the type of file open and the jobsite application.

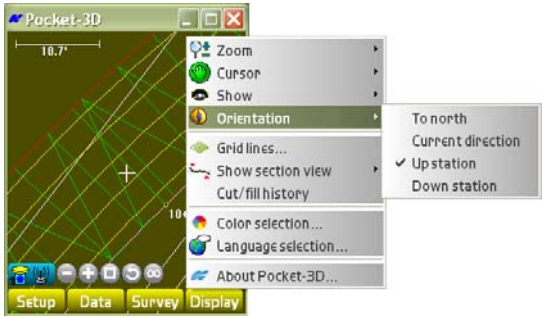


Figure 5-5. Orientation Options

Grid Lines

The grid lines function overlays a grid, with cells at a set interval and orientation over the field surface and the main screen.

To view or change the grid-lines display, tap **Display ▸ Grid lines** (Figure 5-6).

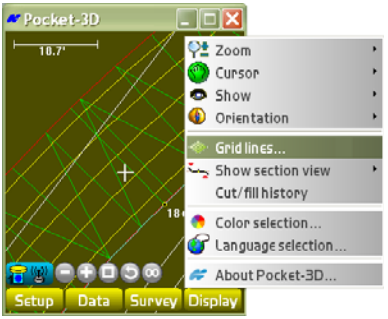


Figure 5-6. Grid Lines Display

On the ***Grid-lines*** dialog box (Figure 5-7), select the desired options for grid-lines, then press **Ok**.

- Display grid-lines – check mark this box to display grid-lines on the main screen; uncheck mark this box to delete grid lines. on the main screen.
- Grid interval – enter a grid interval for the mainfall.
- Grid interval (Crossfall) – enter a grid interval for the crossfall.
- Orientation – enter the orientation of the grid-lines (if you prefer.
- Align grid – press the **Align grid** button to align the grid to the current position chosen for orientation.

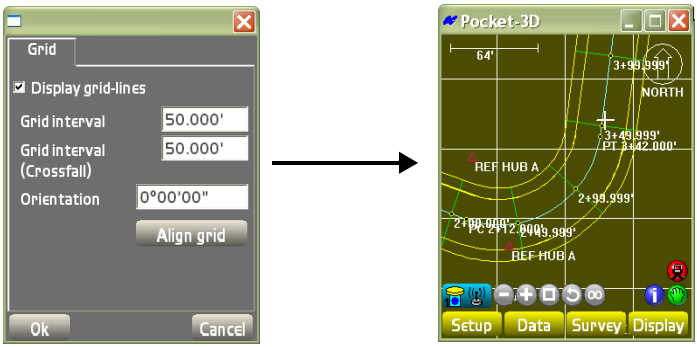


Figure 5-7. Set Grid-line Information for Display on the Main Screen

Show Section View

The section view function displays a small, supplementary window over the main screen with a cross-section of the field at the current position.

To display the section view of the selected surface file, tap **Display ▸ Show section view** (Figure 5-8). The main screen displays a cross section view of the selected design surface (Figure 5-8). Press the ⊖ or ⊕ button to zoom in or out.

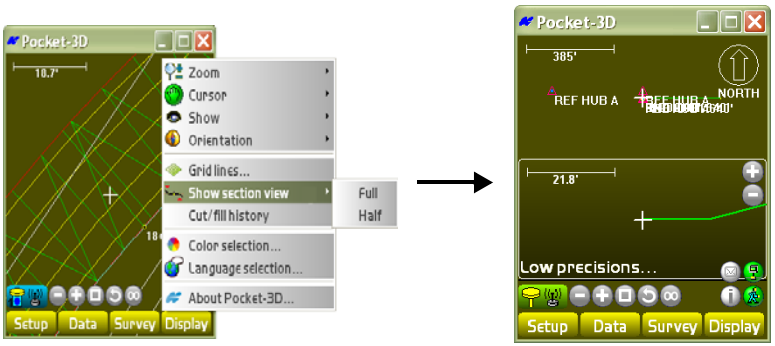


Figure 5-8. Display a Field's Section View

Cut/fill History

For mmGPS applications only, Pocket-3D has an option to view the cut/fill history of the loaded project.

To display the cut/fill history, tap **Display ▸ Cut/fill history** (Figure 5-9).

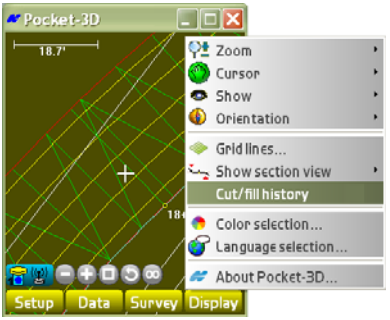


Figure 5-9. Display Cut/fill History

The cut/fill window (Figure 5-10 on page 5-8) displays the on-going highs and lows of the project as determined by both laser and GPS readings.

- The red line indicates mmGPS detection.
- The blue line indicates GPS only detection.

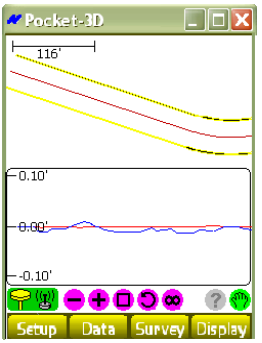


Figure 5-10. Cut/Fill History

See “Cut/Fill “Real-Time” Updates” on page 4-24 for more information on this option.

Grade Indicator

When there is an active surface the Grade Indicator option is available in the Display menu.

To display the grade indicator for an active surface, tap **Display ▸ Grade indicator** (Figure 5-11).

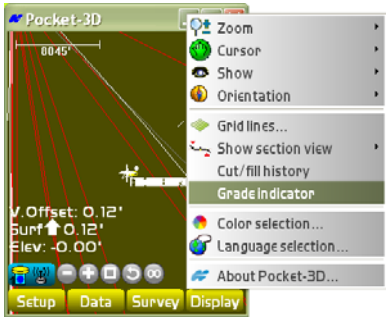


Figure 5-11. Grade Indicator Option for an Active Surface

NOTE: Display Indicator options available only when an active surface displays.

Color Selection

The Display menu changes the background color of the main screen. All text (scale bar, point names, etc.) will automatically display in either black or white, depending on the background color.

1. To change the color of the background for the main screen, tap **Display ▸ Color selection** (Figure 5-12).

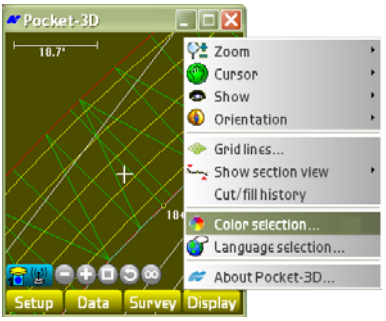


Figure 5-12. Display Color Selection

2. On the ***color selection*** dialog box, select an appropriate contrasting color and press **Ok** (Figure 5-13).

Figure 5-13. Select Color

You will not see black points, linework, etc., on a black background. Conversely, you will not see white points, linework, etc., on a white background.

Language Selection

To change the language used in Pocket-3D, tap **Display ▸ Language selection (**Figure 5-14).

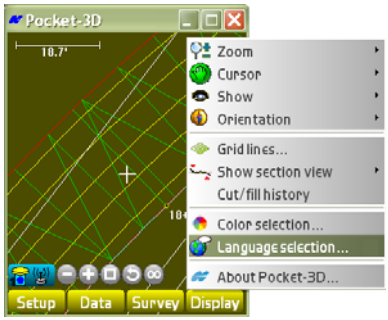


Figure 5-14. Display Language Selection

Select the desired language and press **Ok (**Figure 5-15).

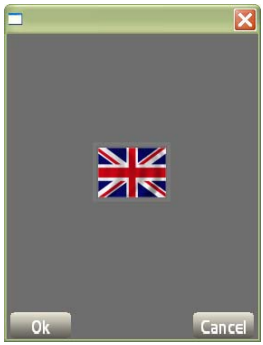


Figure 5-15. Select Language

Pocket-3D will start up next time in the selected language (if there is another option).

About Pocket-3D

To view Pocket-3D information, tap **Display** ▸ **About Pocket-3D** to display the ***about Pocket-3D*** dialog box (Figure 5-16):

- Version number – version number of software.
- Copyright information – name of publishing company.
- Registered to – name of registered user.
- ID – passcodes/authorization codes needed to operate software.

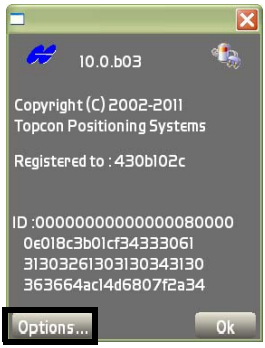


Figure 5-16. The About Pocket-3D Dialog Box

- **Options** – press to display the ***Options*** dialog box (Figure 5-17 on page 5-13).

Options

The ***Options*** dialog box displays a list of all available machine and application options for Pocket-3D (Figure 5-17 on page 5-13). The yes/no column indicates whether or not the option is enabled (purchased).

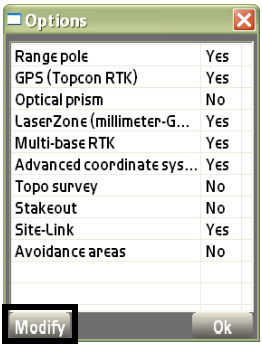


Figure 5-17. Pocket-3D Options (Example)

Modify

On the ***Options*** dialog box (Figure 5-17), press **Modify** to change/edit registered user and authorized options. The ***Pocket3D*** dialog (Figure 5-18 on page 5-14) box displays. After entering the following information on the ***Pocket3D*** dialog box, press **Ok**.

To activate new/changed codes and options, turn Pocket-3D off, then on.

- Device ID – the device identification to give to a Topcon representative to obtain new authorization codes for the desired applications.
- User name – enter the name in which the software is registered.
- Authorization code – enter the codes for the purchased options.
- **From File** – press to copy authorization codes directly onto the GX-60 via the USB port.

  Existing installs of Pocket-3D will automatically be upgraded to the new protection mechanism.

Figure 5-18. Device and Information Authorization

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Notes:

Notes:

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